THE IRON AGE

THE NATIONAL METALWORKING WEEKLY June 15, 1950

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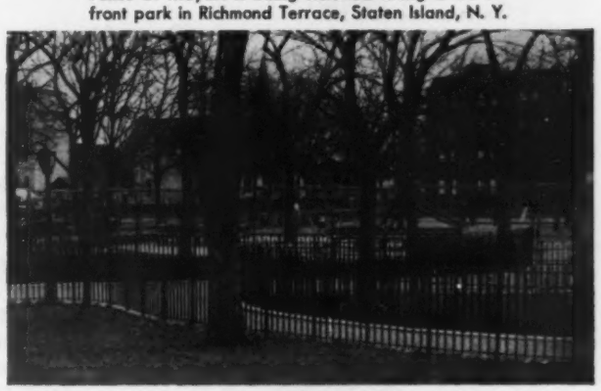
Fence of Mayari R being installed along a waterfront park in Richmond Terrace, Staten Island, N. Y.



Linden Park, Roosevelt Ave., Flushing, Long Island, N. Y., has a fence of Mayari R.

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THE IRON AGE

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JUNE 15, 1950 • • • VOL. 165, No. 24

Special Article

Temperatures as high as 2700°F can be readily obtained for heating metals in a furnace using the radiant heat from a bath of molten glass. Submerged graphite electrodes heat the glass. Electrode and refractory life are greatly improved. Atmosphere control is simplified.—p. 95.

Issue Highlights

A new fabricating technique produces full-size industrial drums with accurately lithographed, multi-colored exteriors and sanitary, noncorrosive interiors. Internal and external coatings are applied before forming operations. Forming does not mar surface finishes. Output is increased. Rejects are fewer and drums are stronger.—p. 99.

Experiments with induction heats using two methods of introducing a 50 pct Al-50 pct Mg alloy indicate sulfur in steel can be consistently reduced to 0.010 to 0.015. Initial sulfur content is not important. Ductility of the steel is improved.—p. 104.

Warehouses are confronted with a double-barreled task. They must placate irate customers while they carry on a fight to get more tonnage from the mills. Flat-rolled products are giving them the most headaches. Some customers are spending huge sums to bring steel from remote areas.—p. 115.

The Justice Dept.'s rebuff in the Aluminum Co. of America suit will mean little to their plans for filing a break-up suit against U. S. Steel. But the court's decision could have a substantial effect on actual court proceedings in any future case.—p. 117.

General Electric Co. has tied part of its future sales potential to a long-term program of civic improvement called "More Power to America." Latest facet is Outdoor Recreation. GE expects to sell lighting long after the community has benefited from the program.—p. 119.

Coming Next Week

Cold headed, double extruded hexagon head bolts are more economical to manufacture than the quenched and tempered variety. Manufacturing methods, mechanics of cold working, the effect of reheating on microstructure, and physical properties of cold worked bolts are discussed in the first part of a two-part article.

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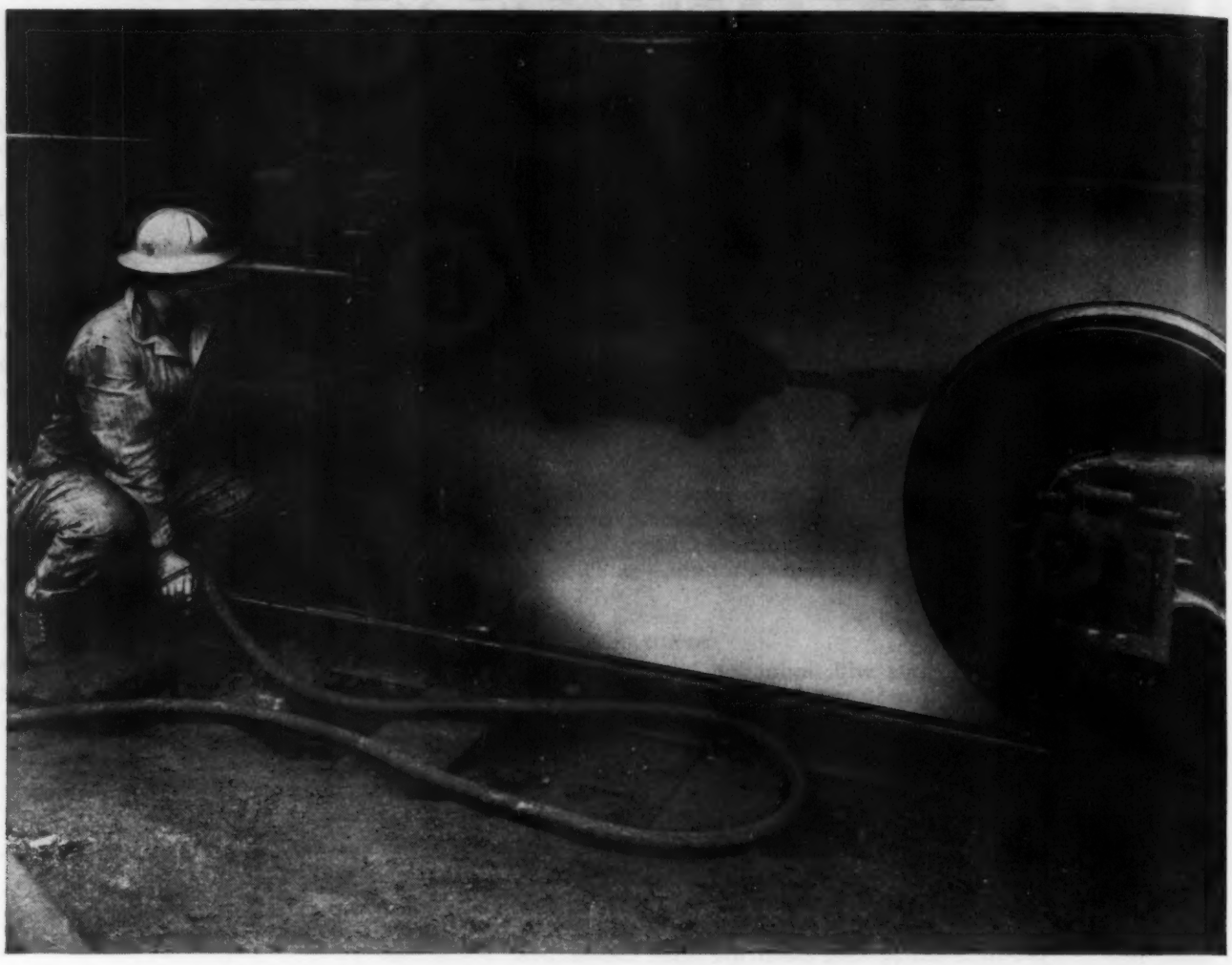

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Ends hazard of scalding and injury from bursting hose wall

THIS is the safest, strongest hose in steam service. Completely burstproof. Steam or steam pressure cannot burst the hose wall. It's B. F. Goodrich Burstproof steam hose, being used here to send steam through the pipes in a tank car to make the liquid flow out easier, quicker. Here's why the operator in the picture is safe, and why this hose will give longer service:

100% tougher cover—On jobs where ordinary steam-hose covers harden and crack, B. F. Goodrich Burstproof will last longer than any other steam hose you've ever used. BFG engineers have developed a rubber cover 100% more resistant to heat, hardening, cracking. Also resists weathering. Exterior wire-winding can be eliminated—with a 30% reduction in over-all hose weight. Sparkproof, for use around petroleum.

Tube beats the heat—Won't deteriorate from constant high temperatures. Made with B. F. Goodrich Agerite, an anti-oxidant that keeps rubber live and elastic.

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B. F. Goodrich Burstproof hose is recommended for saturated steam pressures up to 200 lb. per sq. in.; superheated steam up to 388°F. The BFG distributor near you has further information and will be glad to help you make a trial installation. Call him. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Burstproof Steam Hose BY

B.F.Goodrich

Editorial

INDUSTRY VIEWPOINTS

Brickbats and Bouquets

THE public arena today is not exactly like the Roman Circus of old. But there are a few similarities. People like a fight; and they like some light fencing. They also like to hear good news.

American industry today is putting up a pretty good fight. It no longer waits too long to trade punch for punch. Maybe soon it might get in the first punches in sparring with its critics. That's the way it ought to be.

The more the public hears from business in strong, short punches the better it will be. Gone are the days—we hope—of gobbledegook in answering critics of business. Five cents won't buy much these days but five-cent words are still the best understood. We are getting more of them.

But like everything else too much could be too much, unless it is a varied diet. So, with the good front that business is now putting up there should be another aid to better understanding. That aid is good news.

People get tired of too much backbiting. Politicians may soon overplay their mark along that line. Most of the people may soon find out that all the great social gains are paid for by them—in the final stretch. It is not wise to shoot Santa Claus but someday a lot of grown-ups are going to find out there isn't any Santa Claus in business.

Now is the time for industrialists to liven up their talks with good things to come. Are you making a new product? What will it do for the people? Will it do away with more drudgery? Will it make a better living standard?

What are your immediate plans for better ideas, better products and better working conditions? What are your long range plans? What are your hopes? Where does the man on the street benefit from your outlook?

Certainly you have a lot to say about the future. You plan for it and you work for it. People like to hear these things. They are constructive. People feel they know you when you talk about what's ahead—if it isn't too gloomy. Sure it's all right to warn about the weakness in our economy. It is well to keep the facts straight to offset cagey finagling by demagogues.

But it is also good to sprinkle your remarks with some cheerful news. Life is not all dry rot. We need the brickbats. We need a lot of them. But we need bouquets too.

Tom C. Campbell

Editor

NEW

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Better Power Transmission Through Better Gears

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► The first American gas turbine motor car is likely to be introduced within 5 to 6 years, according to usually reliable sources. It will probably be made by one of the "big three." Some engineers see it as a better solution to the problem of increased driving ease they are now attacking through automatic transmissions.

► Business of manufacturers of chemical and food processing equipment has picked up a lot during the current quarter. These industries are now thinking definitely in terms of more efficient equipment, and the outlook is good.

► The Army Signal Corps is trying out a new type of field telephone wire that weighs only 48 lb per mile. This contrasts with 132-lb field wire used during the war. This is part of a long range transition to lighter equipment of all types, with emphasis on speed and mobility of all signal equipment for combat troops.

► General engineering contracts covering the integrated steel plant to be built in Colombia will probably be signed very soon. Because of the dollar shortage there as in most of Latin America, much of the equipment will probably be bought in Europe. The government-sponsored steel mill has a novel fund raising scheme--a special tax is added to regular income taxes to finance it. But the tax need not be paid by anyone who has invested an equivalent amount in stock of the steel company. So stock sells nicely.

► Some captive coal mine operators are thinking in terms of trackless mining. Some commercial operators have reported increased efficiency with rubber tired and tractor driven hauling equipment; continuous coal loaders are being utilized as much as 50 pct of working time whereas they are idle about 75 pct of the time in mines using rail cars.

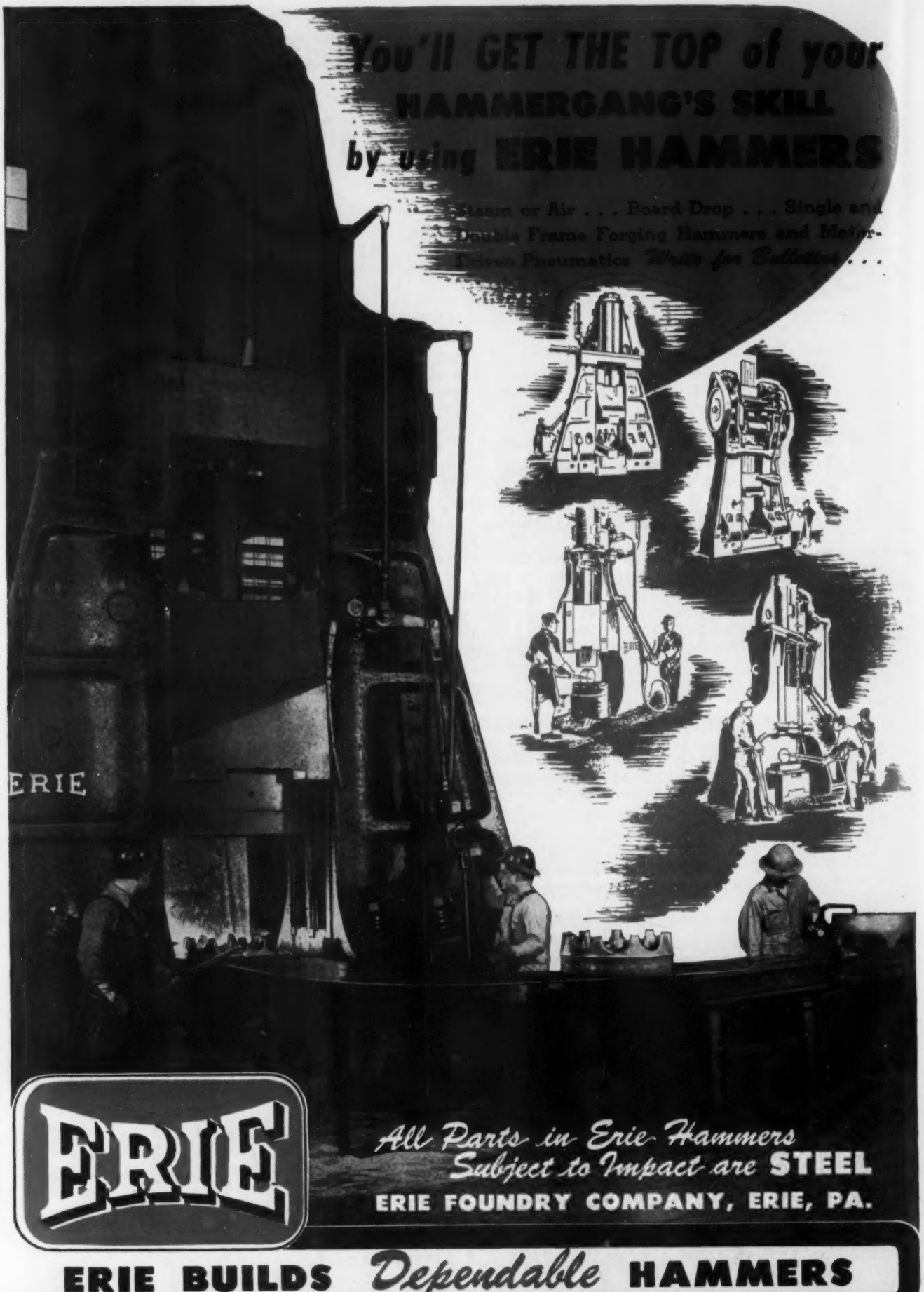
► Recent investigations at MIT indicate that metallic structures produced by hardening show greater resistance to fatigue than comparable hardness produced by conventional heat treatment.

► Rural roadbuilding prospects should improve with development of a new paving machine by a Pittsburgh company. It lays concrete paving like toothpaste being squeezed from a tube--without use of road forms. Paving is suitable for secondary and tertiary roads.

► The interest of metallurgists in the trapped stresses in a quenched piece of steel is still growing. Many are now convinced that more light can be shed on heat treatment by watching these factors: (1) Carbon content of the case; (2) case depth; and (3) concurrence of movement by the case and core during heat treatment.

► A self locking set screw has been designed for excessive vibration and regulation and adjustment applications. Locking comes through use of a larger pitch diameter to create an interference fit or expansion effect against the thread flanks.

► Those who have had some bitter experience in setting up incentive plans agree on at least one point of advice to the beginner: Don't rush into a plan too fast. A plan can be defeated before it is started if a thorough study hasn't been made and groundwork for employee acceptance hasn't been laid.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No Steel Price Rise Seen

Wild Scrap Prices Checked

Mills Plan Allocation Cuts

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

MORE steel companies are joining the premium price parade. Their hand is being forced by higher costs for scrap, nonferrous metals, fuel oil and other supplies. Three more firms have raised cold-rolled strip $7 a ton. Another firm raised hot-rolled strip $5 a ton. Another boosted galvanized pipe $8 a ton. This trend will continue in the weeks ahead.

But there will be no general increase in the base price of steel in the immediate future. Although all major steel producers are gravely concerned over rising costs, none of them are planning to raise prices at this time. They will continue to study their costs, and any further inflation could tip the scales toward higher prices.

This week the action of the scrap market made them hopeful that they would be able to hold the line. Reaction from the wild price rises of recent weeks finally caused prices to soften in major consuming centers. As a result, THE IRON AGE steel scrap composite price dropped 84¢ a ton to $40.08 per gross ton. Scrap prices in secondary markets were still rising in their race to catch up with major centers.

Demand Still Undented

Despite the ninth consecutive week of record production, steel producers haven't been able to make a dent in steel demand. In all major industrial areas steel users are grabbing the metal from the mills while it is still hot—and reaching out hungrily for more. Some are paying huge freight bills to obtain supplies from distant areas. Some are paying premium prices from mills. Some are paying fancy prices for conversion tonnage—and want more. And a few are paying through the nose in the gray market.

What's more, they don't expect any marked improvement in steel supply for several months. They are reconciled to a procurement battle extending through the balance of this year. Most of them aren't thinking beyond that point. But a few farsighted planners have been trying to arrange conversion for the first quarter of next year.

Many steel users and warehouses have already been told by the mills that every effort will be made to work off second quarter carry-overs during the third quarter. This was made necessary because the mills have fallen behind on their delivery schedules. On some flat-rolled products they are as much as 60 days behind schedule.

Allocation Cuts Planned

In effect, working off second quarter carry-overs in the third quarter means that allocations during that period will be trimmed. On some scarce items the cuts will amount to 50 pct or more. Although consumers will continue to receive steel as fast as the mills can turn it out, part of the tonnage will be for orders that were accepted for an earlier delivery. The mills want to operate close to their delivery schedules, and they have become cautious about over-selling third and fourth quarter output.

Although catch-as-catch-can procurement is costing some consumers extra money, and gray hair, too; steel supplies are sufficient to support a very high level of manufacturing. (The auto industry will set a new all-time production record this week.) Steel people are getting plenty of pressure from their customers for speedier delivery, but complaints are surprisingly few. Here are some of the reasons:

Why Complaints Are Few

(1) They have already broken all previous records for tonnage produced in a week or a month, and are a cinch to break the record for a quarter, too. (2) Steel expansion plans (disclosed by THE IRON AGE last week) indicate that even more steel is on the way. (3) Consumers realize they are partly to blame for current shortages because they trimmed their inventories too far last year at a time when steel was easy to get. (4) They know that production delayed because of strikes (29 million tons since the war) is a big factor. (5) Most steel users are pleasantly surprised that business is so good —they are using far more steel than they planned on at the beginning of the year.

(Nonferrous summary, p. 140)

Now—One grease will service all grease applications in the majority of plants

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1. **Extends TIME between greasings**—lasts longer . . . stays in bearings longer.
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Dear Editor

Letters from Readers

Rx For Technologicalitis

Sir:

On p. 32 of the May 18 issue you report the remarks of Mr. Tell Berna, General Manager of NMTBA, before the Hungry Club, Pittsburgh.

Messrs. Berna and Murray each recognize a single horn of the dilemma. New and more productive machinery must be introduced continually in order to maintain the rise in the general standard of living, but it cannot be denied that technological unemployment is very real to those individuals whose jobs are destroyed by progress. The dilemma is pointed out sharply by the introduction of talking pictures. Many musicians were put out of work who knew no other skill and who were unable, due to age or temperament, to develop a new skill sufficient to provide a living equal to the one which disappeared. Many have never worked continuously since the introduction of talking pictures. This is the source of Petrillo's power. Nevertheless, the general good is not served by abolishing talking pictures.

Before an answer to the problem can be found, proponents of each point of view, as represented by Mr. Berna and Mr. Murray, must recognize that technological advances are inevitable and desirable from the standpoint of society as a whole, and also that technological advances have and will continue to create unemployment of individuals. It must be recognized that individuals made jobless by technological advancement will find it difficult to understand the necessity for it. It is understandable that Mr. Murray is concerned with this aspect of the problem. Full alleviation of the economic effect on individuals by some form of a dole would nullify the benefits of technological advances to society as a whole.

Perhaps the correct answer is to be found by recognizing the true nature of the problem, by understanding that individuals affected must find their way into new lines of endeavor, and, finally, by providing assistance to them in finding a new way of making a living. Cooperation between management and labor in such a program would undoubtedly help create peace between them.

LEE G. DAVY
Tennessee Eastman Corp.
Kingsport, Tenn.

You have taken a fair-minded approach to this controversial subject. Regarding your example of talking pictures causing unemployment among musicians, you might have noted that the "talkies" boomed the movie industry, opening up thousands of jobs to various technicians (including sound) and other movie employees, as well as allied industries extending all the way down to theaters in which the movies were shown. But you're right about Petrillo. And we also agree with your conclusion that the general good couldn't be served by abolishing talking pictures.

The movies, however, don't show the result of technological improvements as they affect manufacturing industries. You can pick out a hundred examples from the cotton gin and the loom to the fast machines on the assembly line to the great continuous mills which revolutionized the steel industry. As you suggest, such technological advances are inevitable and desirable from the standpoint of society as a whole. Even Mr. Murray wouldn't advocate going back to steelmaking methods of 50 years ago.

We like your diagnosis of the case and your prescription sounds as if it would help the patient. But it requires more than lip service from management and labor. In addition to agreeing that they should cooperate, they must do something about it. Certainly it is a mutual problem and the responsibility of both is great.—Ed.

Overseas Quote

Sir:

We shall be very glad if you will send us a copy of THE IRON AGE, Jan. 26, as we are interested in the article entitled "Good Tooling Gives Economies in Short Run Production," an extract of which recently appeared in *Machine Shop Magazine*.

D. M. SMITH
Barking Brassware Co., Ltd.
Essex, England

Your interest in this material is appreciated, and a copy has been sent.—Ed.

Seals Aluminum Castings

Sir:

Am inquiring about the product Velvaglaze and would like to get further information on it. We do quite a few permanent molding and I am interested to find out if it has any use in regards to sand castings. Also would be interested to find out if it affects plating in later processing. I came across the development in the May 4 issue of THE IRON AGE in regards to its use by the Monarch Aluminum Co.

E. F. BUSBY
Plating Room Foreman
H. B. Ives Co.
New Haven, Conn.

For more information, write Monarch Aluminum Mfg. Co., 9215 Detroit Ave., Cleveland.—Ed.

Metallizing Info

Sir:

May I have a copy of "Metallizing For Corrosion Prevention" by J. E. Wakefield. I have just finished reading this article in your Jan. 12 issue and find it full of helpful information.

H. C. WOLFE
Welding Section
Electronics Laboratory
General Electric Co.
Syracuse, N. Y.

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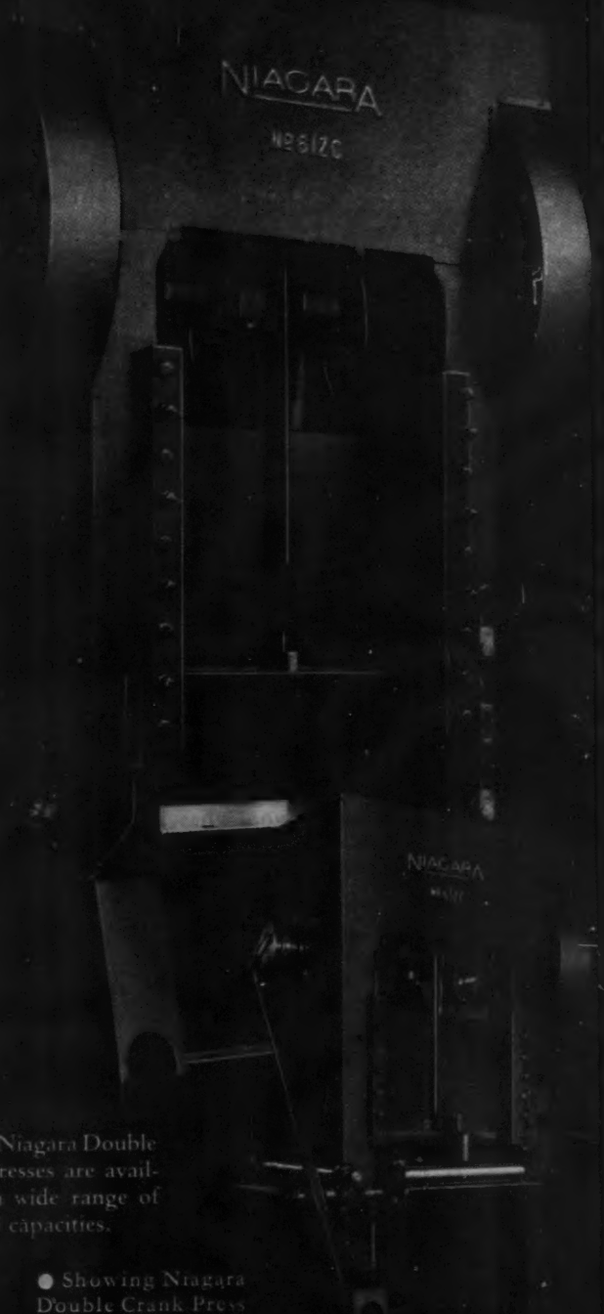


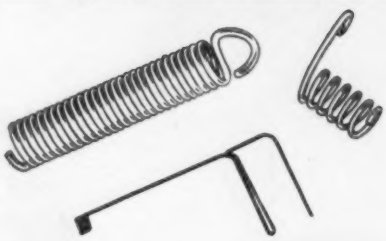
Modern Niagara Double Crank Presses are available in a wide range of sizes and capacities.

● Showing Niagara Double Crank Press with roll feed for continuous operation.

District Offices: Detroit, Cleveland, New York

"Springs are Springs"

maybe so
for most people
... but NOT
for ACCURATE



HOW often have you heard a spring user or even a manufacturer say "Springs are springs, what difference who makes them if the price is right?" Here at Accurate, we think it makes a big difference and our experience proves it. *Exact* conformance to specifications can be mighty important if it means easier, faster assembly and better performance for your product. Quality control is important, too, when it saves you time and trouble. "Know-how" and facilities for making springs the least costly way can mean many dollars for you.

It all adds up to lower overall spring costs for you and that's what we at Accurate have to sell. Before you place your next spring order we would like to show you what it means to you in particular. There's no obligation; write today.

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ACCURATE SPRING MFG. CO.
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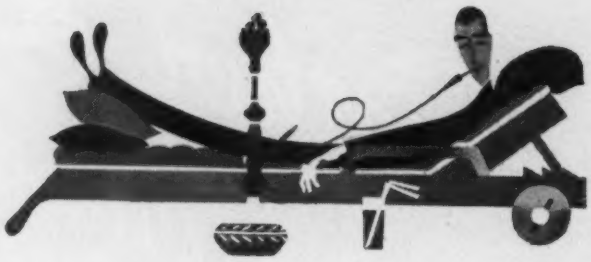

Fatigue Cracks

By CHARLES T. POST

Tiny Sponge

Hottest thing in the theatyuh, according to the aesthetes, is an English playwright, one Christopher Fry. And his latest hit, slated for New York next winter, is a piece borrowed from the French called *Ring Around the Moon*. You may be interested in the commentary of the leading lady on life in the steel industry:

"Lady India: Our squalor would seem like a great dark poem, wouldn't it, Patrice?
Patrice: Very dark!
Lady India: How amusing it would be! I should wash the dishes, and clean the flues, whatever that may be and bake and brew. How beautifully I should brew! I must ask Reseda Soeurs to make me some affecting little aprons . . . And then I shall set to work with my tiny dustpan and my tiny broom. And you will work in a factory. I know so many people on the Steel Board; they'll find you a job as a metalworker easily. You will come home in the evening nearly dead with fatigue and smelling dreadfully. It will be absolutely delicious! And I shall wash you down, my dear, from head to foot with a tiny sponge. It's beautiful to be poor, Patrice."

When the steel industry is nationalized, we suppose every steelworker's wife will be issued a tiny sponge. Ah, the full life with security!

Jekyll and Hyde

From the average salesman's size-up, nothing could be more appropriate than to find Dr. Jekyll and Mr. Hyde in the purchasing department.

Peirce Lewis, who doesn't miss much that goes on in Detroit, reports that the chief purchasing agent of our new subscriber, R. L. Spitzley Heating Co., is A. B. Jaekel. His assistant is W. H. Heyde.

They both like your f.f.j., which makes them fine people and welcome.

Aptronyms

Lynn Brass of the IRON AGE reports that her optician is Dr. Glass; first name, Sidney. Dr. I. Glass, in the next block, practices another branch of medicine. Editor Tom Campbell wonders what has become of Dr. Chew, the dentist, of Uniontown, Pa.

Puzzlers

Starting at 12 o'clock, the hands of a clock form a straight line in opposite directions 22 times in 24 hr, Joe T. Brashears insists, thus clearing up last week's problem.

Jumping back a week: The question of Ann's age was a topic of national discussion some 40 years ago, Charles G. Heilman says. "The puzzle was so well known that 'How old is Ann?' was a byword used to settle any foolish argument," he recollects. He, like Brashear, C. I. Gardner, E. J. Sampson, and Meyer W. Minkin, agrees that Ann is now 16½. Morgan A. Powell and W. L. Jackson solved the money-envelope problem, pointing out that the sequence can easily be carried further. Will C. McGraw paced off the cow's grazing area with his slide rule.

Jackson wants us to solve this one for all digits:

```
          x7xxx
      ------------
xxx) xxxxxxxx
       xxxx
       ----
        xxx
        xxx
        ---
       xxxx
        xxx
        ---
         xxxx
         xxxx
        -----
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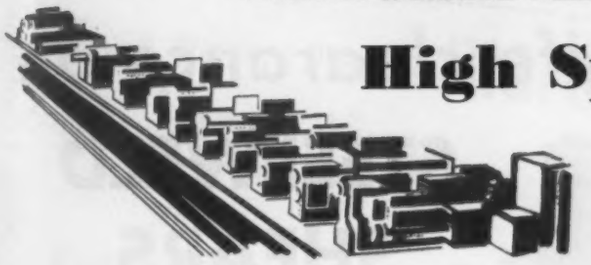
MACHINE TOOL High Spots



Sales Inquiries and Production

By W. A. LLOYD

No Summer Slow-Up? — While past experience points to summer as a seasonally slow period for the machine tool industry, reports from major sales sectors this week gave no hint of an impending change in tempo.

Reports indicated that new order volume is holding substantially the relatively high levels of the past 2 months. However, the distribution of business is uneven, with producers of certain types of machines getting the major share of the spread.

Sizing Up Competition—In foreign markets, company spokesmen report that evidence points to a long period of price differentials, and prospects for volume sales relatively poor.

At the Canadian International Trade Fair at Toronto last week, U. S. machine tool builders took advantage of a good chance to see what their British competition looks like.

About 30 representatives of various U. S. machine tool companies registered daily. Overall attendance, according to reports, was poor. Machinery exhibits drew only 13,000 visitors the first week.

Poor Opinion — Consensus of machine tool people is that British machines are underweight, underpowered and lack the speed ranges of their American counterparts.

On the other hand, the machines are good looking and reflect a lot of credit on their builders and the British machine tool industry. Big question is whether these British machines suit the U. S. market any better than the British automobiles do.

Lower Quality—One sales representative of a prominent U. S. machine tool company put it like this—"If they want to build our kind of machines, their prices would probably be the same as ours."

In Detroit, trade reports indicate that the new Lincoln-Mercury V-8 engine is now well into the quotation stage. It is understood that a considerable amount of the present Ford equipment will be usable for the new job, although the amount of new buying is expected to be substantial.

Chrysler Schedule—Some of the Chrysler equipment for its 8-cylinder job is scheduled for delivery in July and August, but it will undoubtedly be months later before production can be attempted, according to informed sources.

The projected rate continues to be 20 engines a day. The amount of transfer equipment will likely be less extensive than the Olds engine plant at Lansing, for example.

No Hold-Ups — Meanwhile, the Chrysler 6-cylinder engine to be built at DeSoto-Warren seems to be momentarily on dead center, pending the making of important engineering decisions. However, trade sources report there have been no hold-ups on deliveries.

Hudson has placed orders for some new engine tooling, but this will be used on the present model, it is believed.

GM Delay — New transmission tooling for GM Transmission Div. is being delayed temporarily, according to some suppliers, but the delay is likely to be cleared as soon as some major engineering decisions are made.

Finally, there is additional evidence this week that a new Buick V-8 engine program is getting under way. Available evidence points to the erection of a new building especially tooled for the job.

Profits and Earnings — In Worcester, Mass., Reed-Prentice Corp.'s sales and earnings are running well ahead of last year, according to D. H. Dalbeck, treasurer. Reed-Prentice reported net profit of $106,639, equal to 30 cents a share, for the 12 weeks ended March 25, as compared with $67,647 or 19 cents a share in the corresponding period last year.

For the 36 weeks ended Sept. 10, 1949, the company reported net profit of $134,721, equal to 36 cents a share.

Orders Increase — Mr. Dalbeck said the increased volume is coming largely from sales of die casting and plastics equipment. Deliveries on orders being received now are scheduled for Fall delivery.

Press for French—In Buffalo, Lake Erie Engineering Corp. is filling an order for a push-button controlled hydraulic metal stamping press, costing more than $100,000 and the largest privately-financed export order filled by Lake Erie since the war.

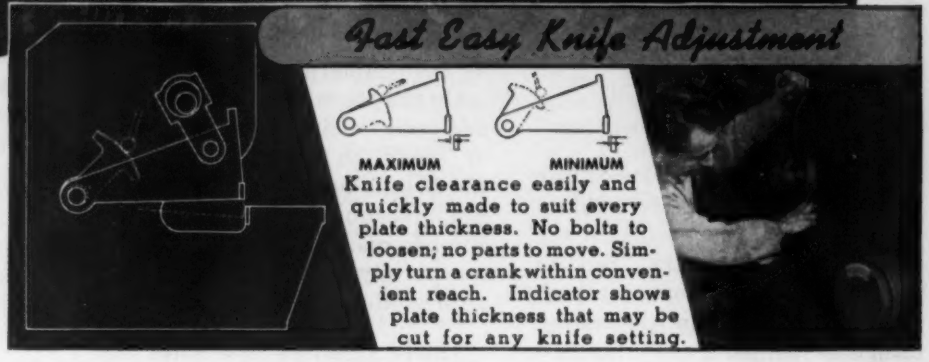
NO PRODUCTION DELAYS

when changing knife clearance on

STEELWELD SHEARS

CUTS 3/4"x10'-0"

This machine cuts plate to ¾" x 10'-0". Other Steelweld Shears available for shearing all thicknesses to 1½" and for lengths to 18'-0". Note the electric foot switch for operating shear — one of many Steelweld production-speeding features.


Fast Easy Knife Adjustment
MAXIMUM
MINIMUM
Knife clearance easily and quickly made to suit every plate thickness. No bolts to loosen; no parts to move. Simply turn a crank within convenient reach. Indicator shows plate thickness that may be cut for any knife setting.

Not hours, not minutes, but seconds — and only a few of them — is all it takes to change the knife clearance on Steelweld Shears.

Shear users, experienced with various makes, are always amazed at the speed, simplicity and accuracy of Steelweld's Micro-Set Knife Adjustment. This feature has strong appeal because they know the importance of having proper knife clearance for the thickness metal being worked on to secure the best possible cuts. They know, too, that with other shears it usually is a major operation to change knife clearance and for that reason is not always done.

Because knife adjustments are made so easily on Steelweld Shears, this becomes a natural step in the working routine of Steelweld operators. It is performed quickly, efficiently, without affecting production. There is no danger of accidental damage. And remember, PROPERLY SET KNIVES REMAIN SHARPER LONGER.

Steelweld Shears are modern heavy duty machines in a class by themselves with a host of features heretofore unavailable. Get the facts and check over the many advantages they offer you.

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CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

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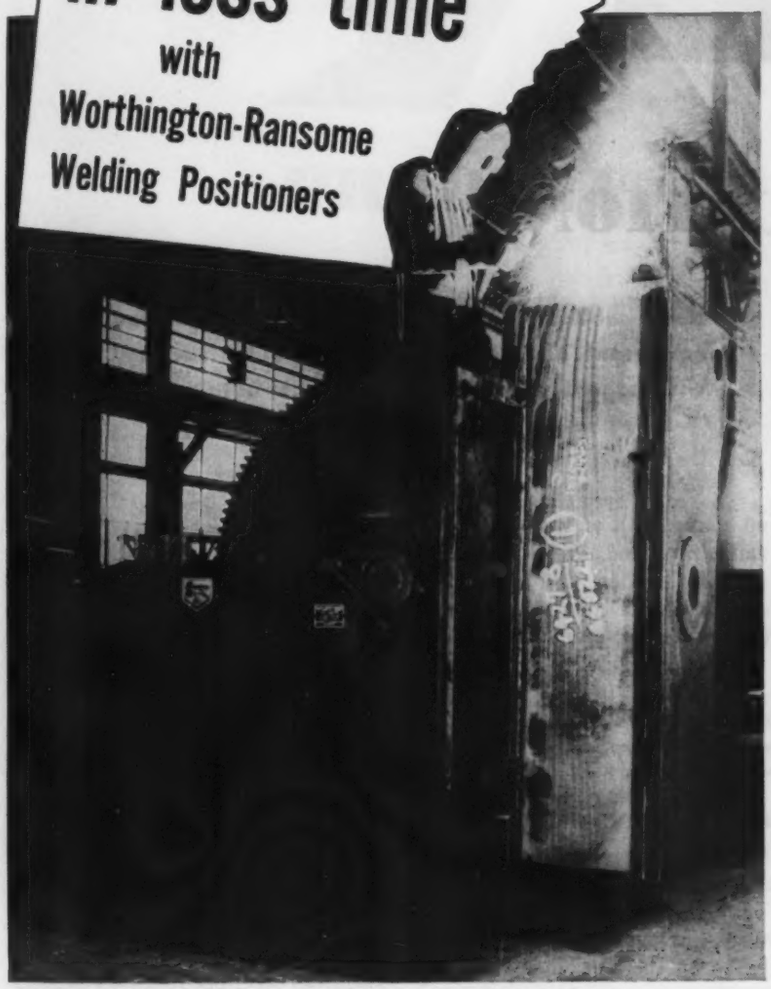
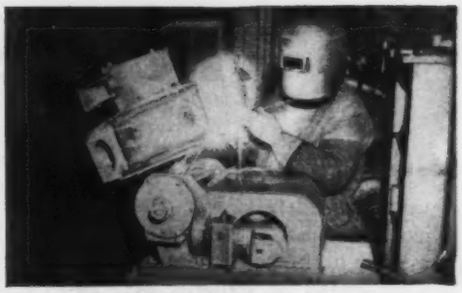
STEELWELD PIVOTED BLADE SHEARS

These Welders Produce more in less time with Worthington-Ransome Welding Positioners

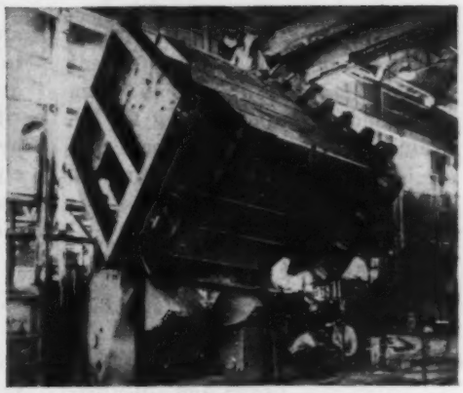


Model 240: 12-ton Worthington-Ransome Welding Positioner

Model 5: 500 lb Worthington-Ransome Welding Positioner



Model 1P: 100 lb Worthington-Ransome Welding Positioner



Model 400: 20-ton Worthington-Ransome Welding Positioner

One sure way to drive production costs down and meet competitive prices is to have a Worthington-Ransome positioner "handle" the work. Your welder can then get more *arc time* out of each working hour.

All welds, either manual or automatic, can be made in the economical "downhand" position, using heavier electrodes, for better, neater, quicker welds.

The full line of Worthington-Ransome positioning equipment includes Positioners with capacities from 100 lbs to 20 tons; and Turning Rolls with capacities from 3 tons to 75 tons, both stationary and self-propelled.

50% PRODUCTION UP
Welding Positioners Turning Rolls
LABOR COSTS DOWN

WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORPORATION
Welding and Assembly Positioning Equipment Division
DUNELLEN, NEW JERSEY

Worthington Pump and Machinery Corp.
Dunellen, N. J.

Please send Bulletin 210C on Worthington Ransome Welding Positioners.

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COMPANY .....

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PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

New Turret Punch Press

Complete details on the new Wiedemann RA-41P turret punch press for high speed piercing work are presented in bulletin 241. Included are actual time studies, clear-cut descriptions and pictures of methods of operation, and specifications. The machine features a turret which carries 16 to 20 different punches and dies up to 3 in. diam and rapid stock positioning for reducing piercing time of short and semi-production runs of sheet metal. *Wiedemann Machine Co.*

For free copy check No. 1 on postcard.

Drawing Die Data

Full specifications for standard wire, bar and tube drawing dies are detailed in a new 4-p. catalog showing tolerances, prices and information on how to order. The catalog includes the recently agreed on new size die nibs and standard casing sizes, and lists other Adamas products for wire drawing, heading and allied fields. *Adamas Carbide Corp.*

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Friction Cutting

Rapid and economical cutting of all types of steel by a softening process is the principle of operation of the Kling high speed friction saws, as described in a new 4-p. folder. Cutting capacities, specifications, general description, operation and standard equipment are covered in the catalog. *Kling Bros. Engineering Works.*

For free copy check No. 3 on postcard.

Propane Cylinders

Harrisburg Lite-Weight propane cylinders, now furnished in a choice of aluminum or red oxide ground coats, with or without caps and valves inserted, are illustrated in a new 4-p. folder. The cylinders are supplied with customer's registered trade mark and serial numbers at no extra charge. Four principal operations in the cylinder manufacture are also shown. *Harrisburg Steel Corp.*

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CompleteConveyerService

Whether a conveying problem involves handling of loads weighing a few ounces or 25 tons, there are Mathews conveyers light or heavy enough to do the job efficiently, as explained in a new 64-p. catalog. The catalog lists specifications and other pertinent data covering a complete line of conveyer rollers and light and heavy wheels, conveyer supports and accessories. Also shown are a number of interesting photos of applications in a variety of light and heavy industries. *Mathews Conveyer Co.*

For free copy check No. 5 on postcard.

New Type Window

Twelve outstanding advantages of the completely new Fenestra steel utility window are presented in a bulletin giving details of construction and installation. The window, now offered completely packaged, is entirely redesigned with open-in sash at the top. *Detroit Steel Products Co.*

For free copy check No. 6 on postcard.

Bromine Container Tests

A new 12-p. booklet recently issued by INCO discusses suitable materials for bromine containers. It includes reports on the studies of various groups of materials, and data on the methods of testing as well as the results obtained, with photos of specimens after exposure to bromine in different forms from between 118 to 124 days. *International Nickel Co., Inc.*

For free copy check No. 7 on postcard.

Stainless Steel Items

The wide range of Schnitzer stainless steel products are described in a new illustrated 50-p. guide and reference catalog, thumb-indexed for easy reference. Stainless steel type numbers are listed with corrosion data on the various types, and prices for all the products are given in addition to specifications. *Schnitzer Alloy Products Co.*

For free copy check No. 8 on postcard.

Hard-Facing Materials

A new line of hard-facing alloy electrodes are announced in an 8-p. bulletin. Purpose of the folder is to acquaint users with the basic hard-facing alloys manufactured by this company, and to present the ideal wear resistant medium for each of a number of individual requirements, inasmuch as no one type of hard-facing alloy is satis-

Turn to Page 130

USE THIS POST CARD

NEW

PRODUCTION IDEAS

New and improved production ideas, equipment, services and methods described here offer production economies. For price and other information, fill in the attached card and mail it.

Centrifugal Pumps

New centrifugal pumps that can be mounted on any motor that has NEMA type C mounting flange, are made in vertical and horizontal types, each in 25 standard sizes. Capacities range up to 200 gpm; heads up to 165 ft; motors ¼ to 7½ hp; and speeds 1750 and 3500 rpm. Maximum total pressure is 125 lb; maximum suction pressure, 50 lb and maximum recommended liquid temperature 200°F. A standard packing type stuffing box head is interchangeable with mechanical shaft seal type head. Pump shaft is stainless steel fitted with compression coupling to assure perfect alignment of rotating parts. *Deming Co.*

For more data check No. 14 on postcard.

Steel Lintels

Formed steel lintels are available in stock sizes of 6" multiples. Corrugated for extra strength, they are specially designed of 9 and 11 gage steel, and come painted with a baked-on special prime coat. *Steelcraft Mfg. Co.*

For more data check No. 15 on postcard.

Welding Plate

Harmful ultra-violet and infrared rays present in electric welding can be screened out with new welding plates. They are graded for density of shade and thickness as set forth in the U. S. Federal Specifications for welding helmets and shields. Welding plates are 2x4¼ and 2x4⅛ in. *General Scientific Equipment Co.*

For more data check No. 16 on postcard.

Carburizer Cleaner

Removing undesirable materials from used carburizer is simplified with a new automatic machine called Carbo-Cleaner. The used carburizer is dumped into a hopper of the machine, fed automatically into a rotary drum and passed over 23½ ft of screen. Ashes and dust drop into a separate bin and the reclaimed carburizer is conveyed through an

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NEW

PRODUCTION IDEAS

Continued

outlet, clean and aerated, ready to use again. The machine is rated at 1000 lb of used carburizer screened per hour. *Thurner Engineering Co.*

For more data check No. 17 on postcard.

Feeder Switches

An improved line of Mesco heavy duty feeder switches for electric traction systems in coal mines and industrial plants can be supplied with quick-break action as optional equipment. Universal terminals accommodate feeder cables from 250,000 to 1,000,000 CM size. The cable clamp includes a pressure bar to assure full and positive contact on the cable. The line comprises six switches to handle 750 to 1500 amp, 250 to 575 v. Switches, in wood or steel boxes, can be mounted in any position. *Mosebach Electric & Supply Co.*

For more data check No. 18 on postcard.

Hydraulic Jack

A new hydraulic jack, called the Go-Jak, develops 10 to 20 tons pressure. Both pumping and releasing phases of operation are under foot control at all times. The jack has two speeds, with a selector valve permitting the operator to choose a speed and capacity to suit the occasion. The body casting is aluminum, heat treated and tested for porosity, with precision made steel and hardened inserts, check valves and screws. *Wihtol Industries.*

For more data check No. 19 on postcard.

Gas Torch

For light brazing, soft and hard soldering and other general heating operations, a butane-propane gas torch, known as the Precision Torch, weighs 4 lb fully loaded and is said to be capable of generating heat up to 2200°F. The torch is totally self-contained in a cylinder 10½ in. high x 2½ in. diam. It can be used in any position and one filling gives 7 hr continuous operation. Pressure is constant until the torch is completely empty. *Precision Engineering & Mfg. Co.*

For more data check No. 20 on postcard.

Chromed Steel Rods

A new chromed steel rod provides a bright corrosion resistant finish said to be suitable for bending, forming, spot welding, butt welding or swaging without damage to the chromed surface. The rods are produced by a two step electroplating process in which nickel is first bonded to a steel rod, chromium is then electroplated over the nickel to provide a hard, high luster, permanent finish. Chromed rods are supplied from 11 AWG to 5/16 in. diam in commercial lengths and with nickel and chromium plating to specified thickness. *Kenmore Metals Corp.*

For more data check No. 21 on postcard.

Crane and Pile-Driver

A new combination crane and pile-driver can be moved easily and economically from job to job for routine and emergency crane and pile-driver work. One unit, one power plant and one crew perform the entire job of driving piles and setting caps and trusses at one spotting. *Orton Crane & Shovel Co.*

For more data check No. 22 on postcard.

Power Elevating Unit

For raising or lowering the work table of J&L pedestal type comparators, a simple motor-driven unit is said to provide 50 pct faster positioning of the table than manual positioning. A single switch lever gives the operator effortless control of the rapid-acting vertical traverse. Delicate final adjustments are obtained manually. *Jones & Lamson Machine Co.*

For more data check No. 23 on postcard.

End Dump

Automatic end dump for use with lift trucks provides simple dumping by a smooth-operating rocker geared to a track. It is claimed to speed up production and save man-hours. The hopper locks during loading by a safety latch.

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THE IRON AGE, New York 17, N. Y. **2**

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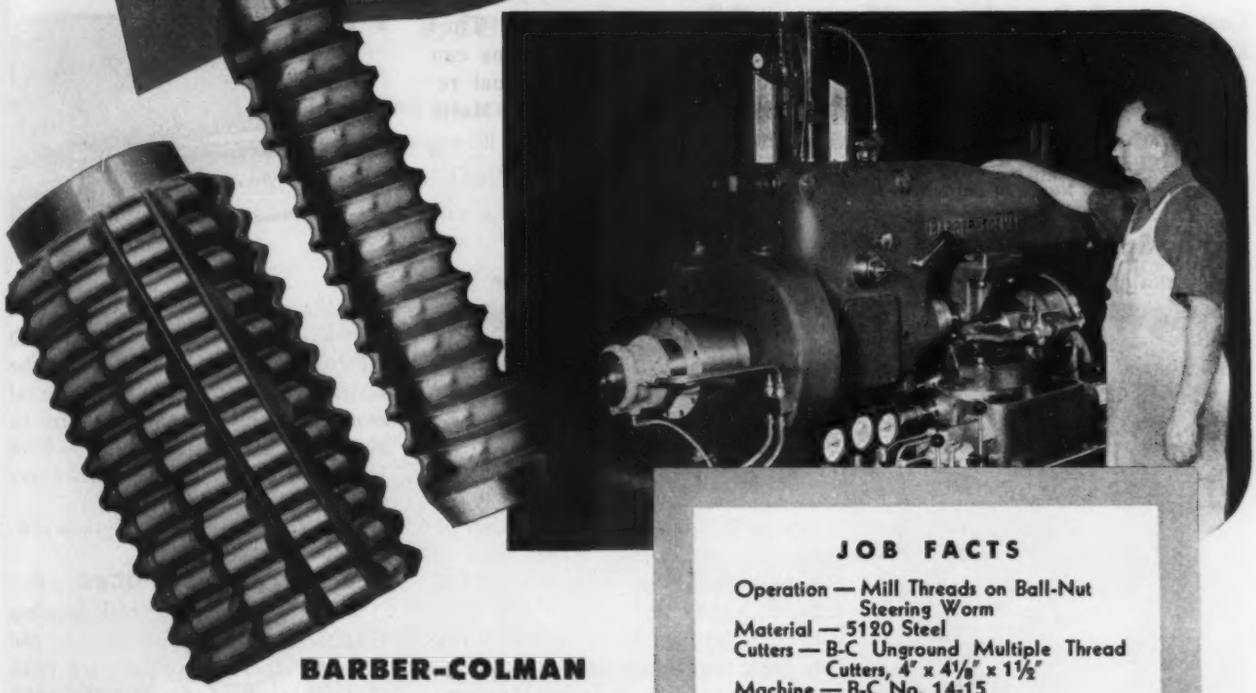


BARBER-COLMAN
THREAD MILLING CUTTERS
AND No. 14-15 HOBBING MACHINE

MILL BALL-NUT STEERING WORMS IN 1.6 MINUTES FLOOR-TO-FLOOR

JOB FACTS

Operation — Mill Threads on Ball-Nut Steering Worm
Material — 5120 Steel
Cutters — B-C Unground Multiple Thread Cutters, 4" x 4⅛" x 1½"
Machine — B-C No. 14-15
Feed — .640"/minute (axial)
Speed — 160 RPM
Floor-to-Floor — 1.6 minutes per piece
Cutter Life — 7175 pieces

Engineered-for-the-job, these Barber-Colman Multiple Thread Milling Cutters are "teamed" with a Barber-Colman No. 14-15 Hobbing Machine to give faster output in worm thread milling. Results of this engineered combination are floor-to-floor time per worm of 1.6 minutes, and an average of 300 pieces per cutter sharpening. Cost per worm naturally has been greatly reduced.

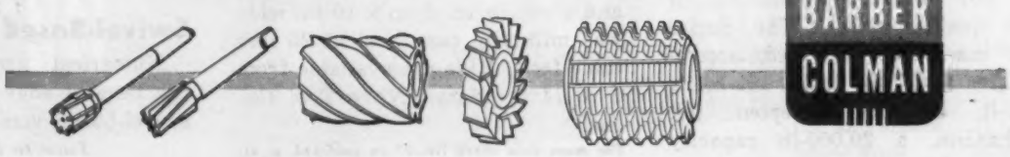
For that extra production bonus on milling operations, consult Barber-Colman engineers. Their experience with cutting tools engineered-for-the-job can save both time and money in getting the job done right.

PRODUCTION GUIDE

Facts and figures on a variety of milling cutter applications. Get your free copy. Ask for File No. 8924.

Barber-Colman Company

GENERAL OFFICES AND PLANT, 8924 LOOMIS ST., ROCKFORD, ILLINOIS, U. S. A.



BARBER COLMAN

NEW PRODUCTION IDEAS

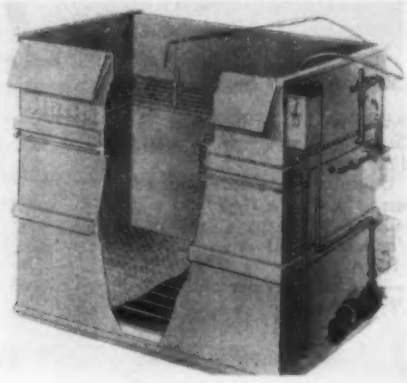
Continued

Casters provide easy moving around machinery and through narrow aisles. It has all-welded construction, built of heavy steel plate reinforced with heavy angles. *Palmer-Shile Co.*

For more data check No. 24 on postcard, p. 41.

Vapor-Spray Degreaser

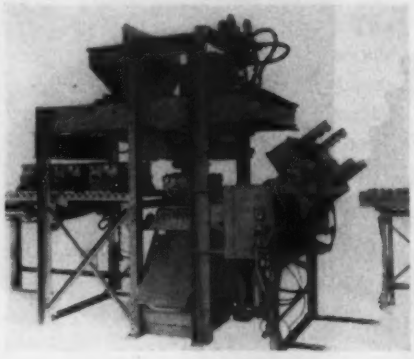
A large capacity vapor-spray degreaser, available in nickel clad, stainless clad or zinc sprayed construction, has a vapor depth of 84 in., inside length, 96 in. x 60-in. width. Its non-flammable, non-explosive solvent, Circo-Solv, is heated by steam, gas or electricity. Heat input assures a cleaning capacity of 18,000 lb per hr. An outside water jacket and inside water coils give double protection against vapor loss. Circo-Solv is claimed to be harmless to all metals and with the vapor-spray method, parts are said to be cleaned and dried in 1 to 15 min. *Circo Products Co.*



For more data check No. 25 on postcard, p. 41.

Automatic Mold Machine

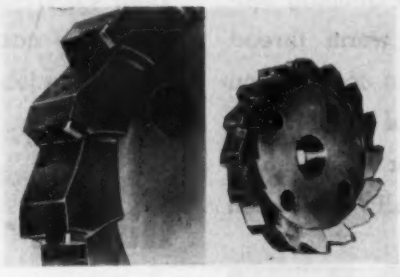
The new Mold-O-Matic machine said to produce 300 drag-molds per hr features a straight through production cycle, minimum number of working parts, accurate control and consistent production of high quality molds. The Series 2000 machine, illustrated, accommodates 14x26 in. flasks. It has a 1000-lb capacity inverted jolt mechanism, a 20,000-lb capacity squeeze, and an 8-in. draw. Time sequence for these operations can be adjusted to meet individual requirements. The Mold-O-Matic can be furnished for production of either drag or cope-molds, and to handle flasks ranging from 12x18 in. to 36x48 in. Standard air vibrators are utilized on the sand hopper, metering box, and stripping frame for efficiency of operation. The machine operates on standard 80 psi, and is controlled by solenoid valves. *Spo, Inc.*



For more data check No. 26 on postcard, p. 41.

Face Mill

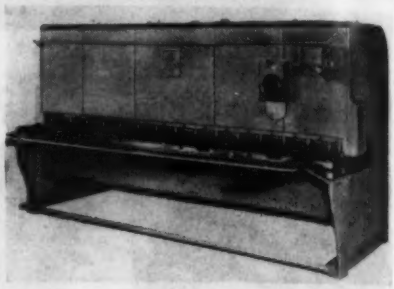
A new Tri-Helix carbide tipped face mill for milling steel has nickel shims, sandwich brazing and alloy steel bodies. New angles are incorporated that are a modification of the Nelco Tri-Helix grind. In actual tests, it is stated that 125 cu in. of metal per min have been removed, consuming only 60 hp, and a cut ½ in. deep x 10 in. wide was milled in cast steel at 25 ipm table feed. Mills are available from 6 to 14 in. diam. *Nelco Tool Co., Inc.*



For more data check No. 27 on postcard, p. 41.

Squaring-Slitting Shear

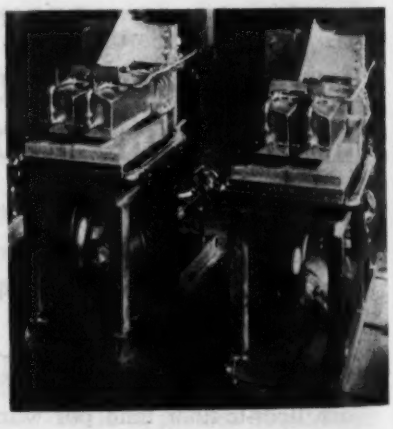
A new sheet metal squaring and slitting shear uses hydraulic power to avoid overload. When shearing, the knife pauses the instant it engages with the stock then eases its way through at constant calibrated speed. A self-contained unit with all working parts fully enclosed, the Hydra-Shear requires no special mounting. It is available in 12 sizes ranging from 10 gage to 5/16 in. shear. *Johnson Machine & Press Corp.*



For more data check No. 28 on postcard, p. 41.

End Heating Furnaces

These high speed end heating furnaces are used for heating the ends of steel oil well sucker rods, ⅝ to 1 in. diam, for upsetting the ends. They operate on natural gas and have a capacity of 180 1-in. diam bars each per hr. Seven bars are in process in the furnace at any given time. The furnaces have a maximum width of 21 in. and heating zone 15 in. wide. Heat input is 1,210,000 Btu per hr. *Surface Combustion Corp.*



For more data check No. 29 on postcard, p. 41.

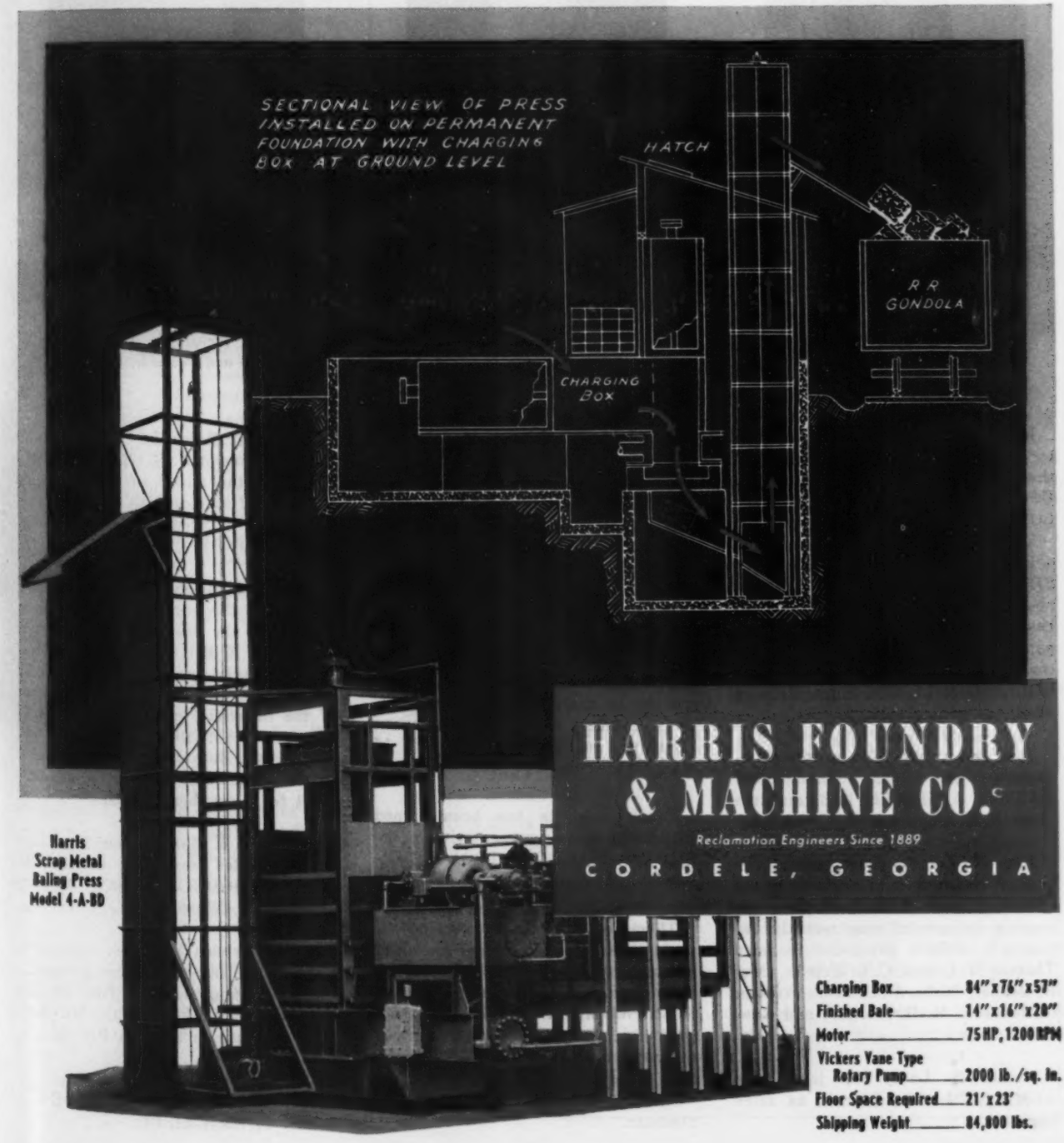
Swivel-Based Vise

Numerical graduations around the beveled edge of the base of a swivel-based vise read from 0° to

Turn to Page 132

THE NEW HARRIS PRESS
WITH BOTTOM DROP OUT FOR BALES
Faster • Cleaner • More Profitable

The new Harris Press with its revolutionary bottom drop-out design averages 38 to 43 bales an hour (avg. wt. 300 lbs.) That's 6½ tons every sixty minutes! This extra speed means extra profits for you. Our engineers stand ready to advise and help on every installation. Write for full details on this sensational new Harris Press . . . Model 4-A-BD.


SECTIONAL VIEW OF PRESS INSTALLED ON PERMANENT FOUNDATION WITH CHARGING BOX AT GROUND LEVEL
HATCH
R R GONDOLA
CHARGING BOX

Harris Scrap Metal Baling Press Model 4-A-BD

HARRIS FOUNDRY & MACHINE CO.
Reclamation Engineers Since 1889
CORDELE, GEORGIA

Charging Box	84" x 76" x 57"
Finished Bale	14" x 16" x 28"
Motor	75 HP, 1200 RPM
Vickers Vane Type Rotary Pump	2000 lb./sq. in.
Floor Space Required	21' x 23'
Shipping Weight	84,000 lbs.

Iron Age *Introduces*

LOREN J. WESTHAVER, becomes vice-president and manager of operations, Geneva Steel Co.

A. M. TREDWELL, JR., has been named vice-president, Sharon Steel Corp.

MAX D. HOWELL, elected vice-president and treasurer, U. S. Steel Corp.

R. G. Glass has retired as a director, vice-president and assistant to the president of GENEVA STEEL CO. and COLUMBIA IRON MINING CO.

R. E. Carter, chief engineer of SHARON STEEL CORP., has announced his retirement due to ill health. He has been with the company since July, 1946, and prior to that was chief engineer of the NILES ROLLING MILL CO., Niles, Ohio., a wholly owned subsidiary.

Sam Boyer has been promoted to eastern district sales manager of DARWIN & MILNER, INC., and was also elected a director of the company.

John E. Jass' appointment to the post of assistant chief engineer in the CATERPILLAR TRACTOR CO. engineering department was recently announced. Others promoted included **Thomas M. Logan, C. L. Kepner, Paul B. Benner, Richard S. Frank, William G. Johnson, M. B. Morgan,** and **Randall Roman.**

Arthur H. Losey has joined the ACME MFG. CO., Detroit, as sales engineer.

Edmund F. Martin has been appointed general manager of the Lackawanna, N. Y., plant of BETHLEHEM STEEL CO., succeeding **A. H. Shonkwiler,** who has resigned. Mr. Martin has been with Bethlehem since 1922. He has been acting general manager of the plant since the first of this year.

J. J. Mataitis was appointed tool engineer for the MIDVALE CO. He will be in charge of tool materials, tool designing, as well as the manufacturing, storage and issuance of machining tools.

Brook A. Getz has been named Pittsburgh sales representative of the SIMONS MACHINE TOOL CORP., Albany, N. Y.

Thomas J. McParland, general superintendent of the West Virginia and Kentucky divisions of U. S. Coal & Coke Co., has announced his retirement. **William R. Stedman** will succeed him. **Lloyd M. Lineberry** was promoted to the post of assistant general superintendent of the West Virginia division, succeeding Mr. Stedman.

Gordon L. Edwards, vice-president and treasurer of U. S. STEEL CORP., will retire this month after more than 50 years of service with the company and one of its predecessor companies, the NATIONAL TUBE CO.

William R. Herman has been named director of the organization planning division of the operation department, and **Frank E. Bell** has been appointed staff industrial engineer in the classification and position planning division of the industrial engineering department of AMERICAN STEEL & WIRE CO. Both have been members of the industrial engineering department for a number of years.

Manford R. Lillengreen was appointed sales manager of BAER STEEL PRODUCTS, INC., Auburn and Renton, Wash.

W. R. Ryburn has been appointed manager of sales, seamless products, for the Spang-Chalfant Div. of the NATIONAL SUPPLY CO. Mr. Ryburn will headquarter in Pittsburgh.

W. A. Lutsch was made manager of the Detroit branch office of DEARBORN CHEMICAL CO.

F. S. Malette was appointed to the post of assistant director of research —air and stream pollution control— for AMERICAN STEEL & WIRE CO. Mr. Malette, who is presently completing work on his doctorate degree at the University of Chicago, has been pursuing the study of industrial toxicology and solving industrial pollution problems for the past 25 years.

Robert S. Neblett will assume the position of assistant manager of sales, turbine division, GENERAL ELECTRIC CO. apparatus department.

John A. McCone, organizer and head of BECHTEL-McCONE CORP., and at one time connected with the LLEWELLYN IRON WORKS and the COLUMBIA STEEL CORP. in California, has been nominated by President Truman as Undersecretary of the Air Force.

Austin E. Cole has been elected treasurer of ILLINOIS TOOL WORKS, Chicago.

Robert E. Ward and **Ralph E. Ferguson** have been appointed manager and sales manager, respectively, of the foundry at Eclipse-Pioneer Div. of BENDIX AVIATION CORP.

E. G. Bergren, general manager of TAYLER & SPOTSWOOD CO., San Francisco, has been elected a member of the board of directors. Mr. Bergren has been associated with the company for the past 10 years and was formerly with COLUMBIA STEEL CO.

Harry F. Devens has been named staff assistant to the executive group of WESTERN BRASS MILLS.

Houston E. Landis, Jr., was elected as vice-president of ELECTROL, INC., Kingston, N. Y.

Edmund A. Watson has been appointed general improvement engineer of the AMERICAN CAR & FOUNDRY CO. He succeeds **John W. Sheffer**, who is retiring after 42 years' service with ACF.

Melvin L. Bunting has been appointed a technical service engineer for the ACHESON COLLOIDS CORP.

R. W. Berg joined the sales staff of the NATIONAL ROLL & FOUNDRY CO.

Mason M. Roberts, general manager of Frigidaire Div., was elected to the board of directors of GENERAL MOTORS CORP. **Roger M. Kyes**, vice-president of General Motors and general manager of the GMC truck & coach division, was elected a member of the administration committee.

Iron Age Salutes

HENRY A. ROEMER, JR.

THE boss' son usually has a much harder time of it than is generally supposed. That is if he is one of those fellows who has the right outlook. The biggest disadvantage he has is the belief of everyone that if he does well his pappy did it for him. And if he doesn't do well—then he just isn't any good and is no chip off the old block.

Now we are not saying that some boss' sons have not had an easy time of it—while they lasted. Many have. But if they didn't have what it took they soon lost out. By and large real talent of the juniors has had to be proven the hard way. Won in such a way that they are given grudging respect by those who always looked for their own sour predictions to come true.

Lots of times these sons have a pretty good idea of what cooks. They know beforehand who will say what and why. They know that if they get a raise the old man will get the credit for giving it. And if they don't toe the mark and walk the chalk line it reflects on the governor.

If they get a job to do they are supposed to outshine and outdo anyone else who might have been given the assignment. If they don't do this—"how in the world did that fellow get where he is." So often the son will cut the apron strings and leave the sharp commands and responsibilities of working for his dad to make good on his own. Maybe later he might hope to come back and carry on.

But many times he doesn't give a hang. The only thing he wants to do is prove to himself and to anyone else interested that he can fly his own kite just as well as the next fellow.

Such is pretty much the picture of Henry A. Roemer, Jr., who this month was made president of Sharon Steel Corp. when his dad moved to the post of chairman of the board—which he had held in addition to the presidency.

Sharon's new president has himself a job. These are tough times for management. But he is prepared for them. He had to earn what he got. When he returned to Sharon after a 13-year workout, part with Republic Steel and part with Pittsburgh Steel, he put to work for Sharon what he had learned. His movements upward were fast. His toughest job is ahead of him.

PAUL C. VAN CLEAVE, elected vice-president of sales, United States Steel Supply Co.

HERBERT JOHNSON, appointed assistant vice-president of sales, Jones & Laughlin Steel Corp.

ROBERT G. RIEGEL, named superintendent of electric weld pipe mill at Fontana plant, Kaiser Steel Corp.

R. J. Casterton is being transferred to the Boston office as sales representative for the Spang-Chalfant Div. of NATIONAL SUPPLY CO. Mr. Casterton had held the same position in Pittsburgh.

Roland W. Burt has been appointed sales manager of the Chicago plant of JOSEPH T. RYERSON & SON, INC. He succeeds **Thomas Z. Hayward**, former assistant general manager of sales and acting sales manager of the Chicago plant, who has been promoted to general manager of sales.

James P. Raugh was elected a vice-president of the GENERAL REFRACTORIES CO.

Frederick G. Schmidt, who has been assistant to the president of I-T-E CIRCUIT BREAKER CO., Philadelphia, has been appointed manager of the newly-formed small circuit breaker division.

W. F. Lisman, former president of LELAND ELECTRIC CO., was recently appointed vice-president in charge of sales for BROWN-BROCKMEYER CO., Dayton. New district sales representatives for the firm include **F. E. Schumacher**, Chicago; **A. H. Hill**, St. Louis; **F. B. Larsen**, Philadelphia; **E. A. Linhart**, Pittsburgh; **Louis Ellinger**, New Haven; and **Ralph Cockroft**, Los Angeles.

John A. Coakley, Jr., has been named president of AUTOMATIC SPRINKLER CORP. OF AMERICA, succeeding his father who died recently. Mr. Coakley will continue as treasurer. He will also assume the office of president and treasurer of AUTOMATIC FINANCE CO. and a directorship in the CLEVELAND STEVEDORE CO. **John J. Power, Jr.**, vice-president in charge of sales, was elected executive vice-president and **Edward J. Eagan** was named to the board of directors.

Edward F. Schalk was appointed sales manager of the stainless steel division of A. M. CASTLE & CO.

Mead L. Bricker, recently retired vice-president of the FORD MOTOR CO., was elected a director of HUPP CORP. He was elected to fill the vacancy created by the death of **Charles A. Awkerman.**

Hardy S. Ferguson joined the pulp and paper engineering division of the H. K. FERGUSON CO.

Stan L. Ostrenga was named national sales manager of the automotive and industrial division of MYSTIK ADHESIVE PRODUCTS.

Raymond L. Howerton is now in charge of tractor equipment promotion for the HYSTER CO. Most recently Mr. Howerton was associated for 2 years with the LINCOLN ELECTRIC CO. as dealer manager in the Pacific Northwest.

O. L. PRINGLE, named special assistant to the president, Columbia Steel Co.

MILTON H. JACOB, who becomes director of personnel relations, Jones & Laughlin Steel Corp.

MARCUS J. AURELIUS, assumes post of vice-president in charge of sales, Columbia Steel Co.

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

More and more auto production records fall . . . Wilson says union merits praise for GM production agreement . . . Buick metallurgists analyze gear specs economics in tech paper.

By WALTER G. PATTON

Full Blast Production — Although official figures are not available, estimated automobile production is expected to reach 200,000 units, another all-time record during the week ended June 10. Regularly scheduled production in practically all U. S. plants is high and the total has been given an extra lift as a result of overtime Saturday work by Chrysler, Ford and General Motors.

Best guess is that these booming overtime schedules will be continued, if possible, well into July. Up to the present time no serious tight spots have developed in the steel supply lines that have not been relieved.

Bottleneck Possible — However, in several instances parts supplier plants have had to call on the big car producers for steel. The number of such shortages is destined to continue.

The first bottleneck that is likely to develop as a result of the ambitious production schedules of the car makers will be steel shortages by the industry's vendors.

Crowded with Records — Meanwhile, public demand for automobiles is also at an all-time high, according to the trade. There are scattered reports that popular models like Cadillac and Chevrolets equipped with a Powerglide automatic transmission are again selling at a premium—just like the hectic postwar years.

Auto sales chiefs can't move in any direction, it seems, without bumping into a new sales record. For example, Chevrolet truck sales for May hit 40,000, exceeding the March record by 2,336 units. W. E. Fish, Chevrolet general sales manager, is confident the company's sales total will pass the million mark before the end of the summer.

More Topple—Hudson sales recently hit a postwar weekly peak of 4,519 cars. Lincoln-Mercury has set new sales records during each of the past 4 months. Buick sales broke all previous May records, and Oldsmobile sales during May set a pace 22 pct above the same period of last year.

Good for Small—C. E. Wilson, president of General Motors, sees no reason why an agreement along the lines of the recent GM contract will not work for small business.

"If I were operating a small business I'd love to take the GM agreement and put it into effect," Wilson said.

Reds Criticize—Wilson said the union deserves a lot of credit for stepping up to an agreement encouraging the use of better tools, newer production methods and more efficient systems. Had this kind of thinking existed among railroad unions, there never would have been a rail strike over placing a second fireman on new diesel locomotives, he commented.

The GM head said that most of the criticism of the new contract has come from the Communist party and from certain financial interest who dubbed the agreement inflationary.

"Less-More" Used—For a number of years there has been a trend away from the use of alloy steels in a passenger car. This trend is continuing, but with a greatly increased output of cars the *total* amount of alloy steel used by the industry is actually higher.

With auto plant metallurgists acutely dollar conscious and modern heat treating equipment permitting faster cooling, the trend

the New Arithmetic in Steel

Make each ton of steel go farther. Get four products in place of three from the same amount of steel. Let the high physical properties of N-A-X HIGH-TENSILE take the place of mass in your product design to boost production per ton as much as 33%. This new efficiency in the use of steel is part of industry's constant search for better materials.

With N-A-X HIGH-TENSILE steel you are assured of high resistance to distortion, impact fatigue and corrosion. Yet you are also assured of excellent cold formability and weldability.

Thus you can redesign many steel products with sections 25% thinner—to save weight, save steel. And further savings in fabricating and finishing pay the way to use of this better, more efficient material.

Let us talk over with you the application of N-A-X HIGH-TENSILE to your product. We believe we can show you how to increase production per ton as much as 33%.

N-A-X HIGH-TENSILE STEEL

GOES FARTHER

Builds More Products per Ton

MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
N-A-X
HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • ECORSE, DETROIT 29, MICHIGAN • UNIT OF NATIONAL STEEL CORPORATION

away from alloy steel is not surprising.

Another factor that is sure to assert itself in the years ahead is the fact that gears for automatic transmissions, being smaller than the gears they are replacing, do not require an equivalent amount of alloy steel.

Gear Economics — Readers of the Assembly Line who are interested in automotive materials, and particularly in steel specifications, will find much interesting data in the SAE paper, "Economics of Automotive Gear Steels and Their Heat Treatment," by V. E. Hense, H. H. Miller and R. B. Schenck of Buick Motor Div.

The authors point out that design, quality, material selection and processing cost are all factors that play a part in determining the economics of automotive gears. Problems of cost, availability, machinability, and heat treating qualities are carefully evaluated.

Comprehensive Study — A feature of the paper which is likely to keep it high on the list of useful information for metallurgists is a survey of leading automobile manufacturers showing current practice on gear steels and their heat treatment. In addition to Buick, metallurgists from Cadillac, Chevrolet, Chrysler, Detroit Transmission Div., Ford, Nash, Pontiac, Packard and Spicer have contributed to the study.

Tabulations show current specifications and heat treatment for rear axle gears, transmission gears, automatic and semi-automatic transmission gears and flywheel ring gears. The study demonstrates clearly that the selection of alloy steels for automotive use and the heat treatment prescribed will vary over a wide range.

Bouncing Era — In the not-too-distant future there may be rubber in both our automobile tires and the pavement they ride on. Experiments conducted by Goodyear Tire and Rubber Co. in America and Holland are promising but as yet inconclusive, according to G. M. Sprowls who gave a paper on this subject at the recent SAE convention at French Lick.

The Dutch method involves coating highways with a few millimeters of rubber. The American plan calls for mixing powdered rubber asphaltic concrete surface. Present indications are that rubberized highways have improved impact resistance, reduced penetration and flow, at 35 pct higher softening point and greater elasticity.

Safety Door—Many of the GM exhibits that fascinated visitors at the Waldorf show have been relocated in the General Motors building in Detroit in a more permanent setting. Included in the exhibit is the new Fisher body door with the safety locking device.

The driver, by pressing down small buttons on the molding of the rear doors, makes inside door handles inoperative, eliminating the possibility that youngsters riding in the rear seat may open the doors by mischance.

Popular Exhibit — "Memory Lane," a big hit of the New York show, has been set up again in the GM building. In the balcony are displays devoted to research, engineering and styling.

One machine measures stress in a crankshaft. There is also a cutaway model of a V-8 high compression engine, exhibits showing the working parts of an automatic transmission and an animated diorama of General Motors' two-square-mile Proving Ground near Milford, Mich. Other exhibits include a cutaway of a J-33 Allison-built jet engine, GM diesels and GM home appliances.

Step Forward — Michigan Tool Co., Detroit, has carried automation another step forward by passing a conveyor right through its 870 model gear finishing machines.

The operator places the gears on the conveyor as they come off the previous operation. The conveyor then carries the gears through the finishing operation and returns them to the operator for removal from the conveyor. The conveyor has spring loaded jaws to hold the gears in position.

THE BULL OF THE WOODS — By J. R. Williams

HE GOT TH' BURLY GUY LIKE THIS AN' GIVE HIS FOOT A BUMP WITH HIS KNEE AN' KNOCKED TH' BIG STIFF OUT WITH HIS OWN KNEE-- I SAW IT ON TH' TELEVISION!
WATCH HOW QUICK TH' BULL FROWNS ON THAT WHEN HE SEES THEM GUYS FROM OUT IN TH' SHOP--HE WANTS 'EM TO THINK IT'S ALL DIGNITY AN' BUSINESS IN HERE!
DETAIL DRAWING CRANE- 23 44 31
6-16 J.R.WILLIAMS
THE LET-DOWN
COPR. 1950 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

YOU WOULDN'T BUY A WATCH THIS WAY...

Why buy lubrication in bits and pieces?

Correct Lubrication is a lot more than just drops of oil and dabs of grease.

It's knowledge of your machines and their exact lubrication needs. It's the *right* lubricant, applied the *right* way. It's engineering service that helps you create one unified lubrication program throughout your plant.

With Socony-Vacuum, you get...

1. A study of all your machine lubrication requirements.
2. Recommendations of the right lubricants.
3. Engineering counsel on special problems.
4. Help on reclamation, storage, handling of lubricants.
5. Continued cooperation with Plant Personnel.
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Correct Lubrication

WORLD'S GREATEST LUBRICATION KNOWLEDGE AND ENGINEERING SERVICE

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

WEST COAST PROGRESS REPORT

Digest of Far West Industrial Activity—By R. T. REINHARDT

Scrap Rise Contagious — Even earlier than this column forecasted (THE IRON AGE, May 25, 1950, p. 63) the spiraling scrap market in the East brought about a rise in West Coast prices. Last week in San Francisco and Los Angeles No. 1 heavy melting moved up $2 per ton with other grades reflecting a similar increase.

The increase is actually more than the offering price since most large buyers are paying those prices f.o.b. shipping point instead of f.o.b. consumer.

"Holding Prices"—Both buyers and sellers frankly state that the increases establish what might be termed "holding prices" to prevent the movement of the better grades of scrap to the East. Chicago and Texas buyers have been in the California market but without too much success.

Best estimates are that current prices will remain firm for 2 or 3 months. Seattle scrap prices remained firm last week although there are indications that prices there might also increase somewhat within a week or ten days.

Cast Grades Hold—In spite of improved business for western gray iron foundries and consequent strong demand for cast iron scrap, no price increases are in sight. Two important factors accounting for this are importation of foreign pig iron and stepped up auto wrecking.

What is believed to be the heaviest single shipment of imported pig iron to reach the West Coast put in its first appearance at Los Angeles late last month. Approximately 9300 long tons of pig from the Royal Dutch Iron & Steel Works of Ijmuiden, Holland, is being distributed along the Coast.

Points of Destination — About 3000 tons were discharged at Los Angeles; about 4300 long tons in San Francisco; and the remainder was destined for the Pacific Northwest. Reportedly this iron is of good quality and is being delivered to foundries for about $45 or $46 per gross ton.

No. 1 cupola cast is selling in San Francisco at from $32 to $33.50 per ton and in Los Angeles at from $37 to $39 per ton. The same importer has three more shipments of pig scheduled and another one reportedly has 5000 tons of pig from Germany destined for the Coast.

Another Record—Not to be outdone by Kaiser Steel Corp., the West's only other integrated steel plant which last week announced new production records, Geneva Steel Corp. in Utah also marked up new monthly production records in every department during May. It was the first time in the history of the plant that all departments set new records during the same month.

The collective performance enabled the company to ship a record 92,000 net tons of steel products. Previous high was 87,502 net tons for January, 1950.

Openhearths Retired — All three of the 50-ton openhearths at Bethlehem Pacific Coast Steel Corp.'s Los Angeles plant were permitted to grow cold last week as the new 75-ton electric furnace was put into operation. This, the largest electric furnace in the West, and the 50-ton electric put into operation 2 years ago, now produce twice as much steel as the old openhearths.

Bethlehem Pacific's 12-in. rolling mill is being rebuilt and a new heating furnace for that unit is under construction.

Printing on Steel—Printing of identification marks on steel and other metal parts is reportedly simplified by a process developed by the Bell Press at Los Angeles. It is stated that any parts of modest size, whether they are thick or thin, symmetrical or odd shaped, flat or curved, can be marked by this process which involves chemicals.

Many government contracts, especially for airplane parts, require such identification and manufacturers have previously relied primarily on hand stamping. Now parts are hauled to the printing plant for this operation.

Gas for Industry—On the heels of an application by the newly organized Utah Natural Gas Co. for permission to construct a $25 million line from the Four Corners field to Salt Lake, the Mountain Fuel Supply Co. filed application for permission to make a change which it claims will increase its supply by 50 pct in the next few years.

PROTECT BACK-UP ROLL NECKS

...with the oil that keeps lines and bearings clean— TEXACO REGAL OIL

Your back-up roll necks roll on a film of oil. When you use *Texaco Regal Oil* the film is tough enough to carry the heaviest loads, and it's *always there*. That's because *Texaco Regal Oil* keeps the oil lines clean, bearings flooded with lubricant.

Texaco Regal Oils are turbine-quality lubricants especially designed to resist oxidation, emulsification and sludging. They stand up under operating temperatures . . . assure smooth, trouble-free performance . . . longer bearing life . . . lower maintenance costs.

The best protection for the reduction gears on the drive side of your roll stands, is *Texaco Meropa Lubricants*. These are "extreme pressure" lubricants with exceptional resistance to oxidation, thickening and foaming. Use them to prolong the life of both gears and bearings.

Throughout your mill, Texaco Lubricants can improve performance and reduce costs materially. Let a Texaco Lubrication Engineer give you full details. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

By EUGENE J. HARDY

Equipment for Arms — Shipments of production equipment to boost arms output in western Europe is expected to increase fairly rapidly during the second year of the Military Aid program, which begins July 1. Present law limits shipments for this purpose to raw materials and machine tools.

The President has asked Congress to remove this limitation so that other types of production equipment can also be shipped. Congress will probably go along with this request. This means that such badly-needed items as shell-filling machines, welding machines, and jigs and dies will be included in future contract authorizations.

Slow Motion—The whole program of military aid has moved rather slowly and the portion calling for machine tools and raw materials, as distinct from weapons, has been even slower. Funds for this purpose were estimated to be about 10 pct of the $1.3 billion first year program.

With only 5 months of the current fiscal year available for shipments, deliveries by June 30 will amount to 152,000 measurement tons, 195 planes, and naval tonnage of over 13,500. By June 30, it is expected that about $1.1 billion of the $1.3 billion appropriated will have been obligated. The program for the coming fiscal year amounts to $1 billion.

Lustron Sale Coming—Buying-in of the ill-fated Lustron Co. last week by the Reconstruction Finance Corp. has placed that agency, for the first time since it became involved in the housing deal, in the driver's seat. RFC is now in a position of being able to make a package deal with would-be purchasers.

Previously, it neither owned the buildings nor the equipment. Now it owns both, the GSA having turned the plant back to RFC. The agency wants to unload this hot potato in which it has sunk $37½ million. It is no secret that several potential customers are nibbling at the bait. All that stands between RFC and possible purchasers is arrival at an "adequate" figure. Officials will not state a figure but it is rumored that less than $10 million would close a deal.

Attractive Tooling—What makes the proposition attractive, in addition to the ability to consummate a package deal, is that the plant is well-tooled in respect to vitreous enameling and metalworking. It is equipped to start turning out bathtubs, washstands, panels and similar products in quantity—assuring operation at a profit from almost the beginning.

RFC officials say they would like to see continued prefab housing production. However, they say this will not carry much weight in their disposal considerations.

Science Program Starts — The State Department will get its new science program into effect as soon as qualified personnel can be found. The program calls for the establishment of a science office headed by a science adviser to the Secretary. In addition, science offices will be established in major U. S. embassies throughout the world, similar to the one that has been operating in London since 1947.

Primary aim is to make international science policy a major instrument in the current drive for peace. The overseas staffs will try to keep abreast of all scientific developments, principally, although not entirely, on an exchange basis.

U. S. Lags in Development—Basically, the plan was put into effect because of the general belief that the U. S. in the past has received more in the field of pure science than it has developed itself.

The U. S. is held to be lagging in international science and past reliance on private organizations to do the job is deemed insufficient, hence, the Government must help. The program also calls for closer contact with scientific organizations and agencies and giving more freedom of entry to foreign scientists regardless of political beliefs. This latter point is likely to bring severe Congressional criticism.

Bigger Files — There's strong sentiment in the Senate for proposals to up antitrust fines to $50,000. The House has already approved—with virtually no opposition—a bill to increase maximum fines from $5000 to $50,000, and chances are good that the stiffer fines will be approved by the Senate when the bill comes up for debate.

Senator O'Mahoney, D., Wyo., sponsor of the proposal in the upper chamber, concedes that the only trouble he expects to meet is in getting the measure scheduled for debate on an already-overloaded Senate schedule.

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Molten Glass

A HEATING INNOVATION

ABOVE—Six electrodes pass through the wall into the molten glass bath of this pusher-type billet heating furnace. The furnace is rated at 1800 kva. It heats billets about 4 in. square by 40 in. long at the rate of 4 to 5 tons per hr. The transformer is underneath the furnace.

Regular carbon electrodes submerged in molten glass permit high temperatures not easily obtained in ordinary reheating furnaces. Electrode and refractory life are greatly improved. Atmosphere control is also simplified.

By DONALD L. CAMPBELL
Mgr., Overseas Sales,
Electric Furnace Co., Ltd., London

USE of electricity for heating steel for forging has been limited in the past to small billets or bars that can be heated by induction, due to the impracticability of using metallic resistors for temperatures above 1900°F and the physical limitations of Globar resistors which prevent their use for heating heavy forging ingots.

The Electric Furnace Co., Ltd. of London, who manufacture and supply all types of metallurgical electric furnaces, have recently taken up the exploitation of an interesting new form of electric heating which was originated some 4 years ago in Italy by Dr. V. Olivotto of Turin. After 3 years of study and experiment with this method of heating, Electric Furnace Co., together with Dr. Olivotto, are now in a position to supply these furnaces for the applications for which they are suitable.

While it is not suggested that this furnace can economically or technically be used universally, there is, nevertheless, a very wide range of applications where this system of heating has definite and proved advantages over others.

The principle involved is, briefly, the radiation of heat from a bath of molten glass, through which current is passed from graphite

electrodes submerged therein. The chief advantage is the fact that high temperatures, up to 2700°F, can readily be obtained for heating metals from relatively small pieces up to ingots of 50 tons or more. Equally important is the fact that this can be done on a thoroughly economical basis where the cost of electric power is not too high. Even where the cost of power is considerably higher than that of oil or gas, the other advantages will, in many cases, more than justify the slightly higher capital expenditure and difference in power and fuel costs.

Some 4 years ago, the first furnace of this type was installed at the works of Fiat, Turin, Italy, for the heating of ingots of from 5 to 8 tons. As the result of 3 years' operation, this company has now ordered four additional Efco-Olivotto furnaces, each capable of heating ingots of 20 tons.

The construction of such a furnace may vary a great deal according to the type of work being carried out. Thus, in the case of an ingot heating furnace, as shown in Fig. 1. In the case of a continuous pusher-type furnace for heating small ingots or billets, the bath of glass may either be placed underneath the work to be heated or across the discharge end of the furnace, as shown in Fig. 2.

A refinement which can be applied to this type of heating consists of a layer of nodular carbonaceous material which can be added to the surface of the glass bath. The effect of this is to increase the conductivity of the surface layer, making starting-up easier and concentrating the heat on the surface of the bath. Also a shallower bath can be used, causing less wear to the refractory lining and emitting a more concentrated heat.

Another flexible feature of this furnace is the fact that it lends itself very well to a combination of two methods of heating. In the case of a pusher-type furnace for high-alloy steels where a gradual preheating zone is necessary, the furnace can be made half heated by metallic resistors, and the high heat end by the Efco-Olivotto bath. Alternatively, gas or oil-firing can be used in oonjunction with the glass bath.

Another form of construction is the rotary type of furnace where the bath of glass is situated in the center of the furnace and revolves together with the hearth. Such a furnace is especially suitable for heating moderate sized pieces of irregular shape, as well as blocks and other similar work. For heating the ends of bars or billets, a single bath is provided alongside the hearth which carries the metal to be heated, Fig. 3. This principle of heating lends itself to quite a range of applications and uses.

From the technical point of view, it has been found that extremely efficient heating is possible. Uniformity of temperature throughout length and cross-section and very accurate temperature control are easily obtained. In

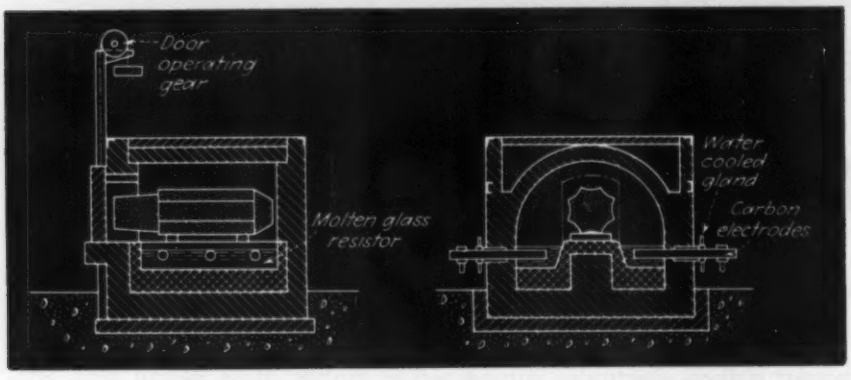


FIG. 1—An ingot heating furnace in which a bath of molten glass runs along each side of the hearth.

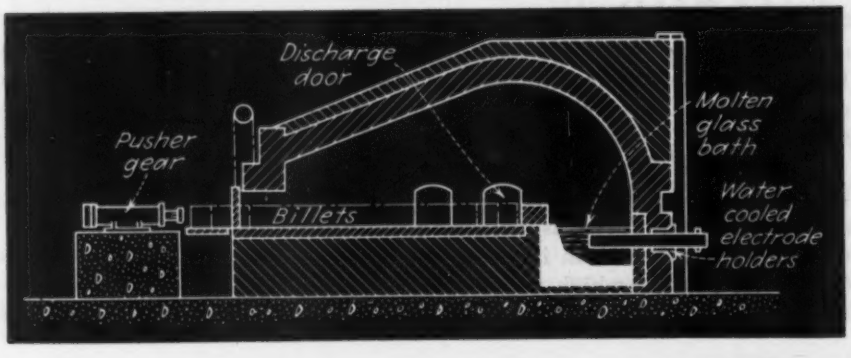


FIG. 2—A pusher-type furnace with the molten glass bath at the discharge end.

addition, due to the entirely tranquil atmosphere within the furnace with the resultant possibility of the introduction of a suitable reducing atmosphere, the oxidation of the metal being heated is considerably minimized and savings in material and the lengthening of die life are assured.

It can be fairly claimed that in no other design of large furnace can a controlled atmosphere, at temperatures of up to 2700°F, be maintained. Furthermore, in the case of irregular shaped forgings, the baffling effect in gas-fired furnaces provides uneven heating, whereas the Efco-Olivotto equipment obviates this disadvantage entirely, thereby reducing the percentage of forging scrap.

Heating Rate Is Accurate

The rate of heating can also be accurately regulated, either by the combination of two different types of heating or by zoning the furnace by means of different sized baths and power inputs. There is no danger of overheating the work, due to the accurate temperature control, which can be entirely automatic if so required, and the even heat dissipation from the bath.

The initial capital outlay of such a furnace will be somewhat higher than for a comparable fuel-fired furnace, due to the transformer and other electrical equipment required. The constructional part of the furnace represents no special difficulties or expense.

The power consumption of this furnace will vary considerably, according to the type of work being carried out. An overall figure of 400 kw-hr per ton maximum can be taken for heating steel from room temperature to 2300°F. Under continuous operating conditions a consumption of 350 to 360 kw-hr per 2240 lb has been obtained over a considerable period. Taking into consideration starting up and standby periods, however, 400 kw-hr per ton provides a suitable basis for calculation.

Glass Cost Negligible

The cost of the glass used in the bath is negligible. Any type of scrap glass may be utilized and the consumption of glass is nonexistent once the furnace has been operating for 2 or 3 weeks, during which the new refractories absorb a certain amount. Consumption of the graphite electrodes is also extremely low, due to the fact that they are totally immersed beneath the surface of the glass, thus avoiding any oxidation, and sealed at their ports by a frozen glass ring produced by water cooling.

Consumption figures taken over a 6-month period at the works of Fram in Italy where an Efco-Olivotto furnace, using 8-in. diam electrodes, has been operating for some 12 months shows a consumption of 1 in. per electrode per month. For the very infrequent electrode adjustments that are required, perhaps once in 3 to 4 months, the water supply to the electrode holder is cut off temporarily, allowing the glass seal to melt and the electrode to be adjusted.

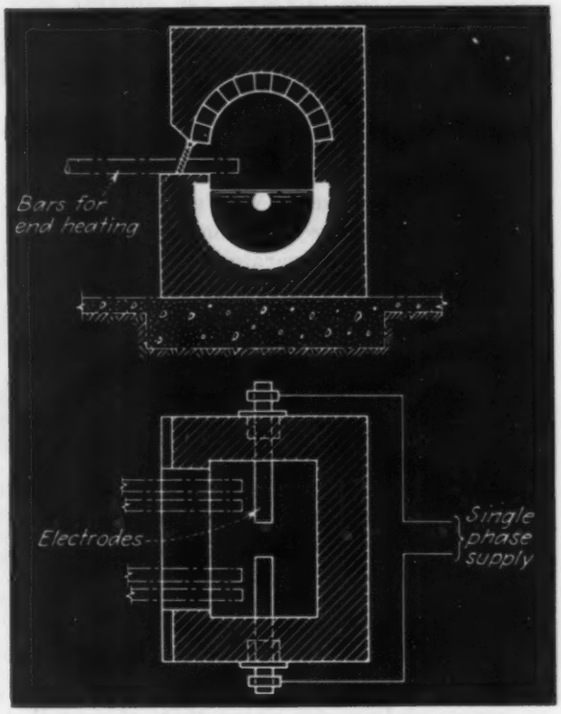


FIG. 3—An application of a single bath of molten glass.

On turning on the water again, a new solid glass seal is rapidly formed.

Results obtained over the period that these furnaces have been operating show a remarkably improved roof and sidewall life over comparable fuel-fired furnaces. This can be chiefly attributed to the temperature of the molten glass being lower than that of a gas flame and also to the complete absence of flame impingement on, or of gases harmful to, the normal refractories used. For instance, the roof of a furnace heating 8-ton ingots in a forge shop lasted for 22 months and, even after this period, only needed very minor repairs. The glass bath itself is lined with a special carbon refractory which also needs only minor repairs at infrequent intervals. The bottom of the sidewalls, through which the electrodes are inserted, is built of a special high-grade refractory and needs occasional patching around the surface of the glass bath.

Other general considerations concerning this type of equipment include the complete absence of chimneys or flues and the capital outlay involved in building them and the saving of

time and effort spent in their maintenance. In this connection, valuable floor space can, of course, be saved, while the surrounding temperature is greatly reduced due to the efficient insulation of the furnace. The working conditions of the operators are thus considerably improved.

From the electrical side, this furnace provides no great problems. The electrical load is ideal in that, on a 3-phase system, it is balanced and has a high load and power factor. The transformer used is of a special type with a rather wide range of secondary voltages to assure accurate temperature control and to enable the furnace to be kept warm during short shut-down periods with a minimum consumption of energy. The transformer primary has a range of tappings and can be connected in star or delta. The secondary has a number of circuits which can be connected in series or parallel by a link-board. The primary is controlled by a tap-change switch, and a range of voltages from 20 to 350 is thus available. Ratings vary, of course, with the application, but for ingot heating the transformer size is quite small—600 kw is sufficient for a 20-ton furnace.

It is interesting to note that the kilowatt dissipation from the surface of the glass bath is approximately six times that of metallic resistors of the same area, thus permitting higher rates of heating or a smaller furnace than with the use of metallic resistors.

An approximate figure for the dissipation from a glass bath is 15 kw per sq ft at 2400°F.

The furnace temperature varies with the temperature of the glass bath, approximately as shown in the accompanying table. For the temperatures shown, the ratio of the glass area to the hearth area will, of course, vary considerably. In the case of heating large ingots, transformers of surprisingly low capacities are suitable for this application.

Glass Has To Be Preheated

Because glass is an insulator when cold, it is necessary to preheat the glass with an oil or gas flame to a temperature of 1300 to 1400°F around the electrodes before switching on the power. Alternatively, iron turnings or other conductive material can be used to form a conductor between electrodes until the glass itself ceases to be an insulator. Although by applying maximum power it is possible to heat up the furnace rapidly, it has been found best to start the furnace rather slowly. Once the furnace has been in operation—unless the shut-down period is to be very extended—it is best to keep the under surface of the bath warm with a minimum power input but the surface itself can be allowed to freeze over. When the furnace is then required to operate again, it requires a relatively short time to bring it up to temperature.

Scale is removed from the furnace by ordinary means, but any scale dropping into the bath is rapidly reduced to iron and, when sufficient iron is formed to make it worth while, this is drained off from the bottom of the glass bath. This has no ill effect whatsoever on the operation of the furnace.

When the furnace is to be shut down for rebricking and repairs, the molten glass is drained off into a suitable container, thus allowing the bath or trough to be repaired as necessary.

GLASS V. FURNACE TEMPERATURE

Glass Temp., °F	Furnace Temp., °F
2190	1470
2280	1830
2550	2370
3000	2730

Applications in hand at the present time for this type of equipment include furnaces for heating ingots up to 20 tons; a continuous pusher-type furnace for 10 tons output per hr of billets 4 in. square x 6 ft long. In this latter case, the glass bath is both along the sides of the furnace and in places actually underneath the work to be heated. Another continuous pusher-type furnace is for the heating of 3 tons per hr of long and short billets for drop stamp forging. In this case, due to the high quality of the steel involved, a preheating zone of metallic resistors brings the metal up to 1550°F at a controlled rate of heating and the Olivotto bath placed across the discharge end of the furnace raises the temperature of the metal to 2300°F before extraction to the drop hammers.

Another application is the annealing of stainless steel strip in a catenary type furnace, and yet another is a rotary furnace, the glass bath being in the middle and the pieces for forging of various shapes and sizes are placed on the rotary hearth and discharged after a revolution through 360°. In this last case, the control of the speed of rotation, as well as the power input, makes very accurate temperature control possible.

In all these examples, the two important points in planning the installation are the careful design of the radiating surfaces of the furnace and the accurate computation of the bath area and the electrical input.

Rheem Forms 55-Gal Drums AFTER COLOR LITHOGRAPHY

By L. A. REBER
Plant Manager,
Rheem Mfg. Co.,
New Orleans

New fabricating technique produces full-size industrial drums with accurately lithographed, multi-colored exteriors and sanitary, non-corrosive interiors. Internal and external coatings are applied before forming operations. Forming does not mar surface finishes. Output is increased and rejects are fewer.

ALTHOUGH the fabrication of small metal containers after lithographing and lining operations has been a standard manufacturing procedure for many years, roller-coating, handling, and drying equipment had never been designed in sufficient size and weight capacities to handle the 36-lb, 3x6-ft sheets of 18-gage steel of which full-size drums are made.

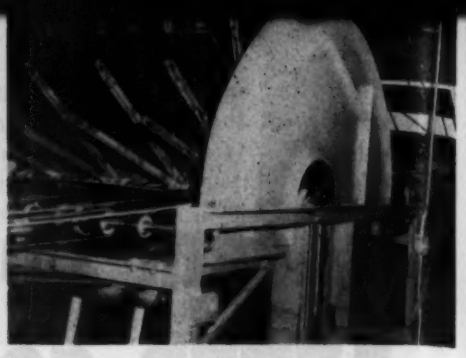
Executives of the Rheem Mfg. Co., together with the management and engineering staffs of the New Orleans plant, envisioned the idea of full size, lined and lithographed drums several years ago. They felt that the steel container market demanded a large precision-lined drum that would give more satisfactory service than was possible with sprayed linings. Further, they believed that shippers would welcome a large-volume container that would carry trade marks and brand names with the detail and authenticity of smaller metal lithographed containers. Rubber dies, silk screening and stenciling were previously used to decorate large drums. All these techniques fell far short of the accurate reproduction of words and figures possible with lithography.

It was planned to line the inside of large size drums with sanitary, non-corrosive materials and to accurately lithograph brand names onto multi-color exteriors. Rheem engineers worked closely with Wagner Litho Machinery Co. designers for many months in developing and perfecting the roller-coating equipment. Rheem expended more than a million dollars in the initial development of the process. Feed equipment for the huge press, the roller-coater, the oven, the fabricating line, and take-off equipment for the line emerging from the end of the oven was specially built by the Dexter Folder Co. Rheem let contracts to R. Hoe & Co. for a lithograph press capable of meeting requirements of 55-gal drum stock.

The press, roller, and drying equipment arrived at New Orleans in mid-1949. Each unit was the largest of its kind ever built. The newest versions of standard drum fabricating equipment were ordered from regular suppliers. They

A LITHOGRAPHY PRESS, above, lithographs sheet stock emerging from roller coater.

B THREE-STAGE OVEN pre-heats, bakes, and cools lithographed sheets at rate of 4200 per hr.



C SHEET INVERTER turns baked sheets upside-down as they emerge from oven, right.

Rheem Forms Drums

Continued

included (1) a vacuum shot blast unit to abrade the edges of lithographed and coated sheets clean for welding contact, (2) an electric resistance continuous seam lap welder, and (3) forming rolls to curl the sheets into cylindrical shape. A twin unit starts flanges in the ends and expands rolling hoops into the center of the shell. A double seamer curls the head and bottom over end flanges of the shell.

Most of this machinery was modified slightly to allow drum fabrication with the least possible strain on the inner and outer coatings. In addition, many fabricating line components were devised and built by Rheem engineers. The company worked closely with paint and chemical suppliers in determining which coatings, linings, and inks would best lend themselves to decoration and coating of drums.

Sheet steel is stored as received in bundles of 160 to 180 sheets. Each bundle weighs on the order of 6000 lb. Feed equipment at roller-coater and lithography press, see A on schematic drawing, picks up each sheet with rubber vacuum cups and starts the process. The coater, press, and oven are all geared to a maximum speed of about 4200 sheets per hr. This is many times faster than the speed of the fabricating line because a run of sheets may have to make several trips through the press-roller-oven department for one trip through fabrication.

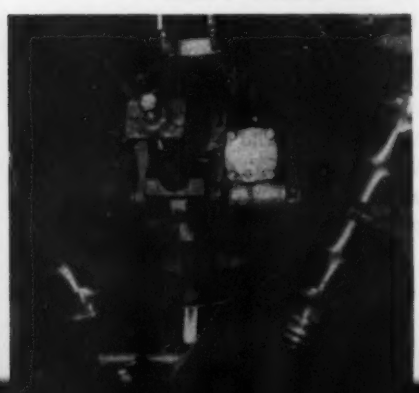
The oven, B, covers 210 ft of the 300-ft-overall press-oven unit. It has three sections: (1) A pre-heat portion heated to from 200° to 275°F; (2) a baking section in which heat is controlled at from 275° to 450°F; and (3) a cooling section that reduces sheet temperature at a controlled rate. Temperature control is essential to eliminate possibilities of thermoplastic effect. It also prevents the transfer of coatings from one sheet to the next when baked steel is stacked at the discharge end of the oven line. Each sheet in passage through the oven spends 6 min in the pre-heat section, 15 min in baking, and 7 min in the cooling portion.

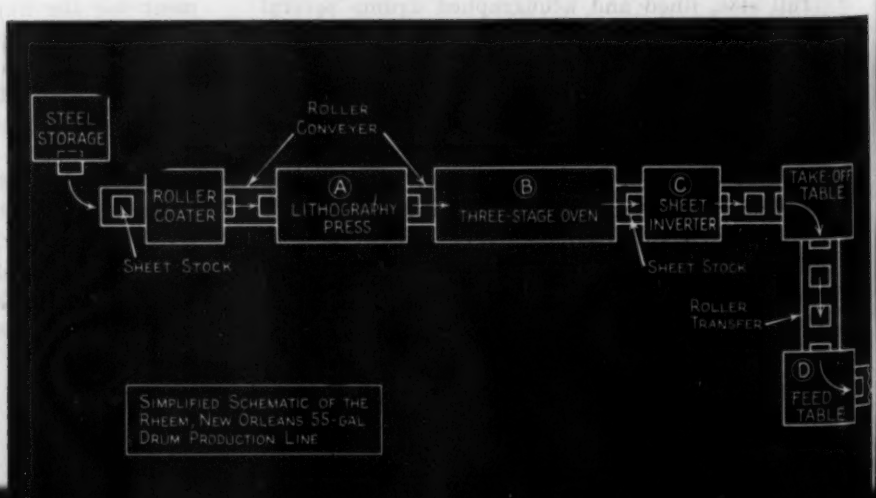
A Dexter sheet inverter at the discharge end of the oven conveyer can be engaged or disengaged at will, see C. This machine delivers sheets at the end of the oven. Sheets are positioned with either coated side up for return to the roller-coating press, or face down for transfer to the fabrication line.

After baking the base coat, a run of steel can be returned to the press for lithography. In this case it makes one trip through the press for each color to be lithographed. If the order is for lined drums, the drums are returned through the roller-coater, face down, for application of the inner lining before they are lithographed.

On completion of the last press or roller operation, sheets are delivered in stacks to a Dexter feed table, D, at the start of the fabrication line. Conveyer rollers and contacts throughout the line are made of wood or plastic, or are rubber-coated, to avoid scratching the gleaming surface of sheets and drums. Each sheet moves from the feed table through a pair of vacuum shot blast units. Here a 5/16-in. margin along each side of both ends of the sheet is abraded for clean

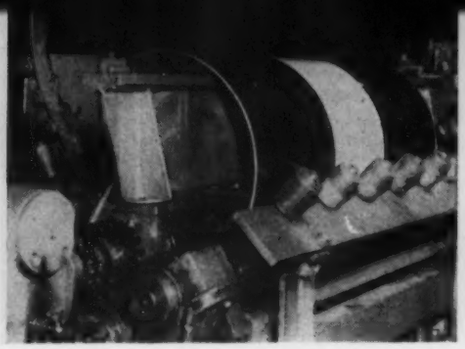
F WELDER close-up shows copper wheel forcing seam of drum against similar lower wheel.



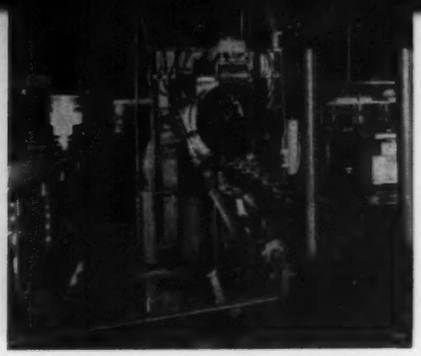


SIMPLIFIED SCHEMATIC OF THE RHEEM, NEW ORLEANS 55-GAL DRUM PRODUCTION LINE

D FEED TABLE propels sheets face-down through vacuum shot-blast unit, where edges are cleaned.



E FORMING ROLLS shape drum from flat sheet without marring smooth lithographed exterior.



F CONTINUOUS SEAM WELDER applies electric weld to drum shell edges.

surface contact in the welding machine.

A roller transfer unit moves the sheet into forming rolls, E, which curl the metal into a loose, open-sided cylinder. Rolls are kept highly polished to protect both outer surface and inner lining of the drum. From the forming unit, the drum shells are propelled through the National seam welder, F. Here a continuous electric resistance lap-welded seam is formed at a rate of 35 fpm. Normal operating speed of the welder is 500 per hr, maximum speed is 650 per hr.

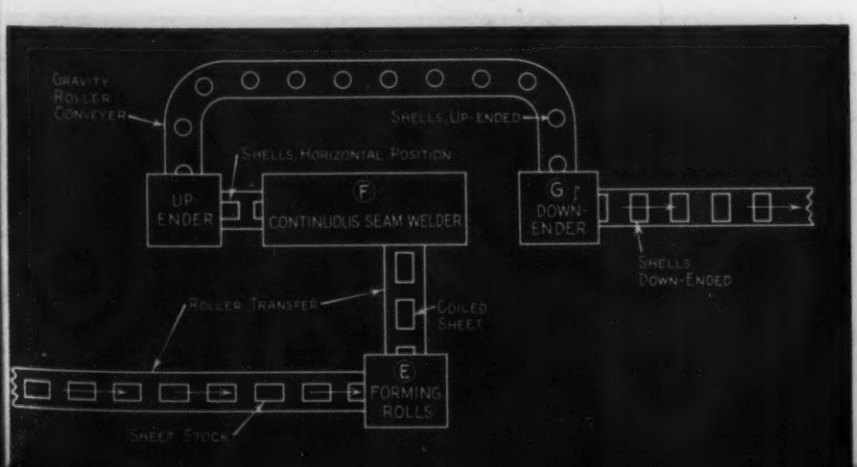
Perfection of the Rheemcote process required a welder that would heat only a narrow strip along the seam. This was necessary in order to avoid blistering or burning the inner or outer finish. Continuous seam resistance welding proved the ideal answer. With this process, heat is confined to the abraded metal strip at the seam. Temperatures do not rise enough outside a 1-in. strip to threaten any damage to the finish. A special interior touch-up technique was developed to apply a uniform coat of lining material to the welded strip. This process was an important key to successful fabrication of steel drums after inner lining.

Highly polished "hour-glass rolls" at the welder hold the drum shell in perfect cylindrical shape as the weld is formed. The shell is carried away from the welder to a specially designed up-ender shown in schematic.

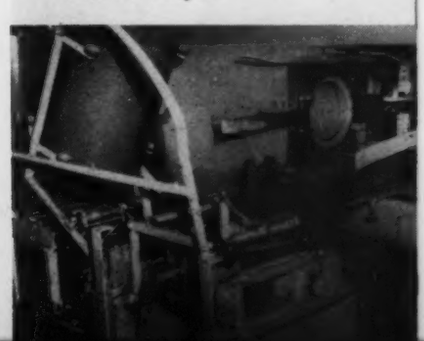
This unit picks up the shell from its horizontal position as it emerges from the welder. Without marring the finish, the shell is set end-up on a gravity conveyer. The conveyer functions as a storage and feed line for subsequent fabrication steps. Drums travel end-up on the feed line. This conserves space and avoids unnecessary friction on the coated exterior surface. The drums are down-ended at the next fabrication step. The down-ending machine, G, grips the drum with rubber-clad arms and places it on the fabrication line parallel to the floor. In this position the longitudinal axis of the drum is perpendicular to the direction of the line.

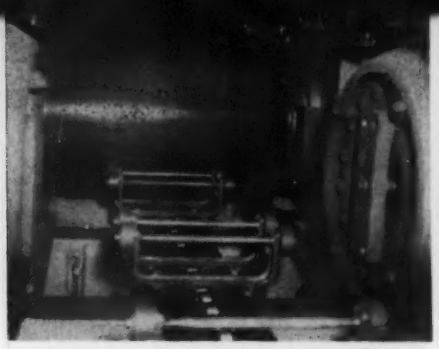
The next step is a flanging operation in the twin flanger-beader unit, H and I, that also swedges the rolling hoops. Flanges are started on both ends of the shell. The flange-starting operation was kept separate from the swedging operation to avoid placing too much strain at one time on the coated metal. The swedging operation consists of: (1) Finishing the flange; (2) forming the rolling hoops in the drum; and (3) discharging the drum to its next operation. Each drum is shortened by 7/16 in. in the swedging operation. The over-all height of the drum after swedging is 34½ in. Expanding dies are mechanically actuated. The driven rings of the swedger are chrome-plated and are kept highly polished. This insures smoothest possible contact with the drum during expansion. Experience with rubber covered expanding dies has proven them very successful. It is likely that this innovation will be continued.

Heads and bottoms are inserted in the drum as it leaves the swedger, see J. This operation adds a step to conventional drum manufacture. This is because with lithographed drums and heads, positioning of the head with relation to decoration and copy on the shell, and with relation to the side seam of the drum, is important. Heads are applied to proper position. A head press

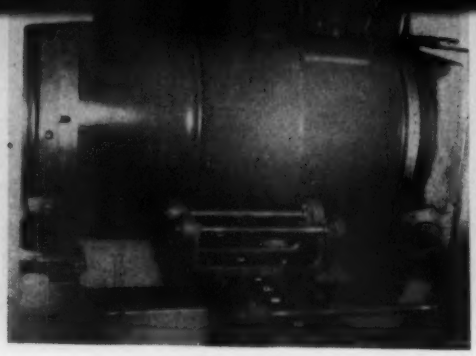


G DOWN-ENDER takes drums from roller conveyer and repositions them for flanger.

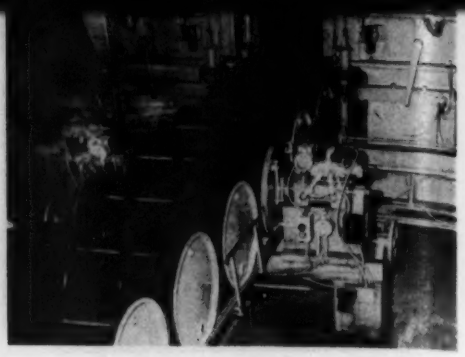




H FLANGER expands ends of drum shell before beading, avoiding strain on coated metal.



I BEADER forms rolling hoops in drums. Left hoop is finished, right is beginning to appear.



J HEAD ASSEMBLY gives inserted drum heads and bottoms a friction fit in head press.

Rheem Forms Drums

Continued

forces the head and bottom into the shell with a light friction fit. Conventional operation provides for head and bottom to be forced into the drum by the inward movement of the chucks of the double seamer in the next manufacturing step.

In the old technique, the double seamers ran at a constant speed. Uncoated drums were gripped by the chucks while they rotated. Seaming rolls were then lowered into contact with the edges of the drum head and bottom. The seaming rolls were not powered. They were driven by friction with the head, bottom and shell. These rolls first curled the edges of head and bottom over the flanges at the ends of the drum. They then doubled the resulting seam over on itself forming a double seam. This double seam resulted in the familiar chime, or head, at top and bottom of the drum.

In the Rheemcote operation, the seamer chucks are stopped and started for each cycle, see K. Chuck parts have previously been chrome-plated and faced with rubber. The seaming rolls are independently driven. They rotate at the same speed as the chucks. The drums reach the seamer with the heads in position. Next, the conveyer stops, the hydraulically actuated chucks move inward and grip the drum, and the drum is spun rapidly. The operating speed of the seamer chucks is 180 rpm.

The seaming rolls, idling constantly, are lowered against the head and bottom. They form first the single, then the double seam. Heads and bottoms, stamped out in the press department, are given a partial pre-curl as they are formed. Therefore less pressure and friction is required from the seaming rolls. This reduces strains on the coated head and bottom.

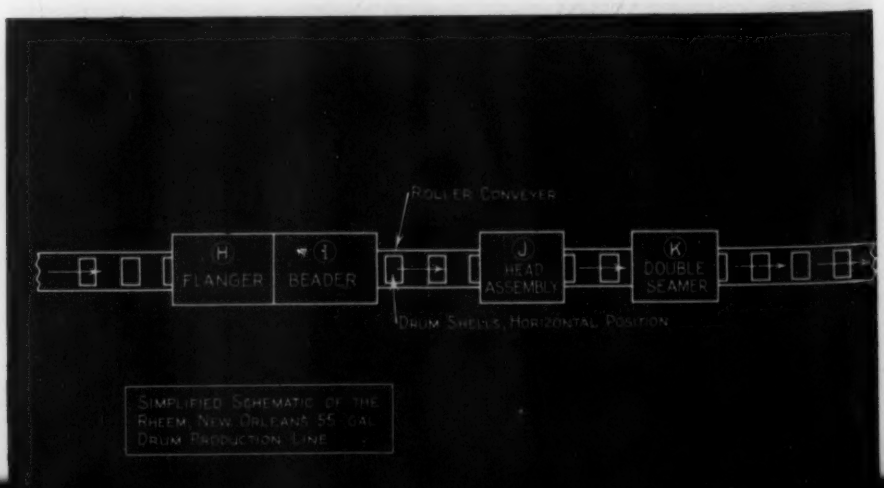
When the drum leaves the seamer another up-ender, L, picks it up and sets it vertically upon a conveyer that brings it through the air testing unit, M. This up-ender makes contact with the drum at only three points. It is also devised so that virtually no friction is applied to the surface of the drum.

The air test equipment in use overcame one of the severest bottlenecks threatening high-speed automatic drum fabrication. Conventionally, one or two men are required to operate an air tester at a maximum speed of about 250 drums per hr. Using the Rheem tester, 550 drums can be checked for leakage each hour. The operation is nearly fully automatic, requiring only one man to watch the testing operation.

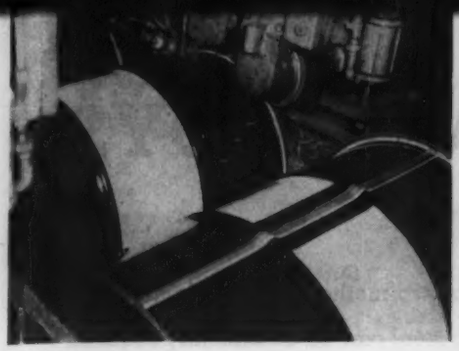
A pressure head is lowered to the top of the drum as it stops under the test unit. The drum is sealed and air pressure is built up within. The operator flows a jet of water down the seam of the drum, watching for air bubbles. When the test is completed, the air is evacuated, the seal is broken, and the drum moves on down the line. Under the old method of manufacture, leakers were as many as 2 pct of production. Under the new method, leakers average only 0.5 pct of production. They are repaired by acetylene welding.

The next operation is coating the outer side

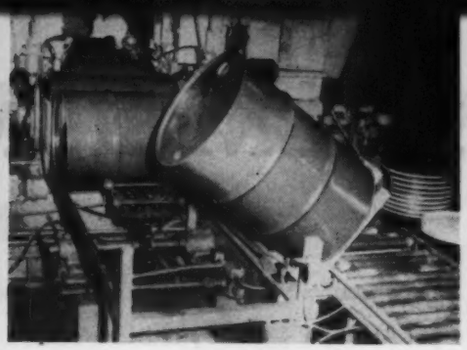
N SEAM PAINTING is accomplished by spray applying air-dry base coat through mask.



SIMPLIFIED SCHEMATIC OF THE RHEEM, NEW ORLEANS 55 GAL. DRUM PRODUCTION LINE



K DOUBLE SEAMER turns drum head rim over shell flange, before forming air tight seam.



L UP-ENDER picks finished drum from seamer and places it on conveyor without marring finish.

M AIR TESTING consists of filling drums with air and flowing jet of water down seam.

seam, see N. This was left bare in roller-coating and lithography. It is shot blasted before welding. The shot blast unit uses #G50 chilled steel shot at a pressure of 90 psi. Vacuum is used to recover the shot. Spent shot is returned for reuse by this means only. Dust is removed from the re-circulated shot by a dust collector. A special mixture of the base coating is sprayed, through a special mask, down the seam of the drum. The mixture is an air-dry preparation. From this stage, the drum moves into another fully automatic operation, the chime spraying station, see schematic.

In the automatic chime spray touch-up operation, the upright drum is rotated at high speed while (1) circular wire brushes thoroughly clean the chime, and (2) special spray nozzles force an air-dry mixture of the roller-coat compound on the edges of the chime. This is done so that they are evenly coated in the color of the body.

This is the final operation in the fabrication process. From the chime sprayer, the drums are conveyed on a cable conveyer, P, to a loading dock where trucks or box cars are filled for prompt dispatching to customers.

In the press department, where heads and bottoms for the drums are formed, operations are nearly conventional. Exception to this is the pre-curling of heads and bottoms when they are blanked and formed. Dies on all press department equipment are kept highly polished. Head and bottom sheets are processed in lithography and roller-coating just as the larger body sheets. Two heads are pressed from a single roller-coated lithographed lined sheet. Bottoms are lined by roll coating and pressed in the same manner.

Heads and bottoms are placed in racks specially designed so they must be lifted and tilted only slightly for withdrawal. This avoids any unnecessary friction or marring against pieces in the racks.

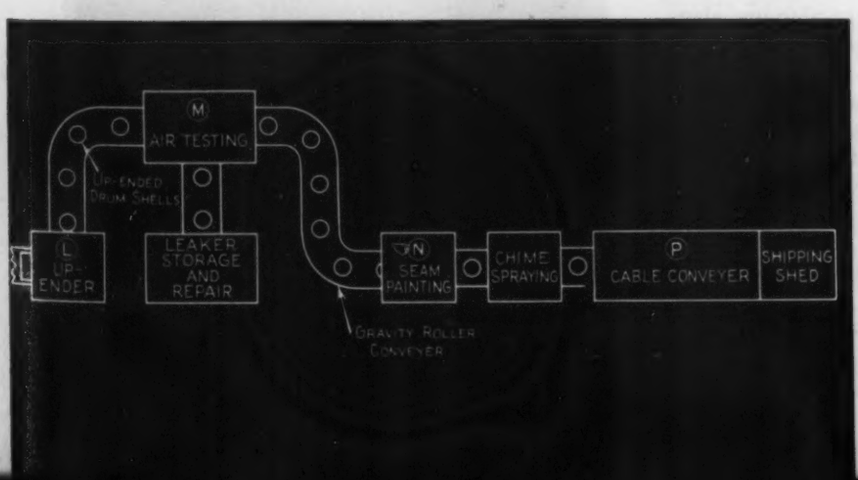
Base coatings for roller application to drum exteriors are provided by major paint suppliers. Rheem chemists constantly cooperate in research with these companies in search of new materials.

Rheemcote application lends itself to use of oleo resinous coatings as well as vinyls, phenolics, epons, and urea alkyds. Linings are applied in thicknesses ranging from half a mil (0.0005 in.) to as thick as two mils (0.002 in.).

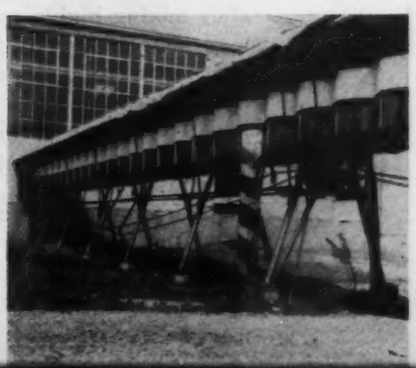
Rheem uses both hot rolled and cold rolled steel in drum fabrication. The selection depends upon the requirements of each order and the service for which each lot of drums is destined.

While the prime objective of the Rheemcote process was to fabricate 55-gal drums after color lithography and inner lining, an important accompanying objective was the streamlining of the whole operation of drum manufacture. Rheemcote methods have accomplished both goals. The capacity of a single drum production line has been accelerated nearly 100 pct. The automatic fabricating operations freed men from fabrication line jobs and released them to other tasks within the plant.

Development of the process has resulted in fabrication of drums that combine durability and versatility with new merchandising and advertising value. Also, production has been stepped up without any substantial personnel increases.



P CABLE CONVEYER delivers finished drums from fabrication line to shipping shed.



MAGNESIUM ALLOYS

Experiments with induction heats using two methods of introducing a 50 pct Al-50 pct Mg alloy indicate sulfur in steel can be consistently reduced to 0.010 to 0.015. Initial sulfur content not important; ductility is improved.

STEELS having sulfur contents below 0.030 pct are desirable for a number of reasons. In the wrought steel industry high sulfurs lower the transverse ductility properties and may result in hot shortness. Conditioning costs are reduced considerably when sulfur contents are kept at a low level. In the steel castings industry, difficulties due to grain boundary eutectic sulfide inclusions are reduced when the sulfur content is low. Hot tearing characteristics of cast steels are also associated with the sulfur content. High sulfur appears to increase the tendency toward hot tearing in castings.

A reduction in the general level of the sulfur content of all steels would have an important bearing on the consumption of strategic manganese by the steel industry. It is usual practice to have a Mn-S ratio of 7:1 and more often 10:1. Therefore, lower sulfurs can result in the use of less manganese.

In the basic openhearth and basic electric processes considerable time would be saved if a quick method of desulfurization were available for use in place of the present time-consuming refining period. In acid practice where desulfurization by present methods is not feasible, any new scheme for sulfur removal would be advantageous. Furthermore, the elimination of the refining periods in electric furnace practice should enhance the possibility of producing steel relatively low in gas content.

The Ugine-Perrin process,[1] developed in France, although effective in sulfur removal is considered somewhat expensive and cumbersome. In this procedure steel is poured into a ladle containing essentially a molten lime-alumina slag. The Perrin slag has to be melted in a separate furnace.

This paper outlines the methods used for safely mixing highly reactive materials, such as magnesium alloys into molten steel for purposes of desulfurization. Since the work to date has been exploratory the results given are merely indicative of the possibilities of this scheme. Optimum operating conditions have by no means been worked out.

The first relatively quiet method found for introducing magnesium into steel was by injecting the magnesium into the melt in the form of an extruded wire ⅛, 3/16 or ¼ in. in diam. The wire was fed through a lime cover into the steel at a controlled rate. A hand-operated clothes wringer was used as the controlled feeding device. One end of the magnesium wire was placed between the two rubber rolls. The other end was led into a ¾ in. gas pipe approximately 20 ft long bent in such a way that the magnesium wire was directed vertically downward into the melt. A conical shaped funnel was mounted at the end of the pipe to act as a hood over the furnace to catch any sparks or spatter of metal.

Fig. 1 illustrates this practice on a 50-lb induction furnace. It was found that, in order to eliminate spatter of molten metal and magnesium, a slow rate of feed had to be used. The rate varied with the wire diameter. In order to carry this method into production, a number of comparatively small diameter wires would

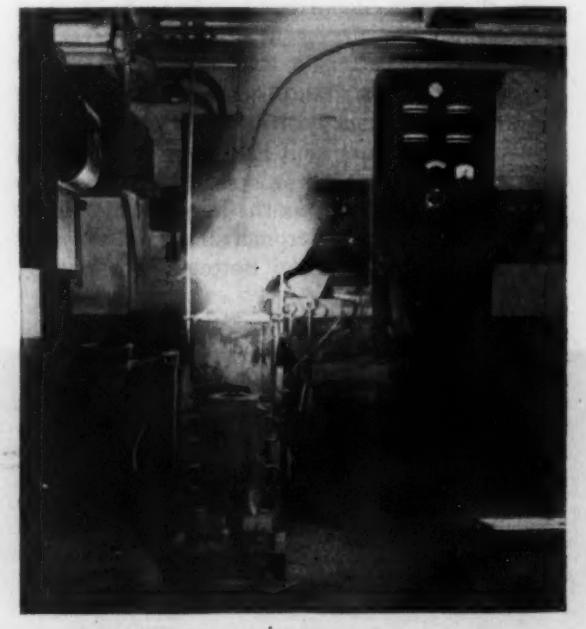


FIG. 1—Desulfurizing with the wire insertion method.

AID DESULFURIZATION

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have to be fed simultaneously through continuously cooled jackets into the metal either in the furnace or in the ladle. This method was set aside temporarily in favor of the crushed alloy-slag method which appears to be much more practical.

Granulated magnesium or magnesium alloys were intimately mixed with dried lime alone or in combination with dried fluidizing agents such as borax, soda ash, and fluorspar all in varying proportions. This mixture was then thrown into the bottom of the ladle in paper bags and molten steel was poured on to it. Fig. 2 illustrates the latter operation on a 500-lb basic induction unit. Certain combinations gave very quiet reactions.

Structural steel scrap was loaded into the induction furnaces. When the charge was half melted, powdered sulfur was added to make up the required initial sulfur content, approximately 0.030-0.050 pct, of the finished steel. After the steel was completely molten, carbon, ferrosilicon, and ferromanganese were added to adjust the composition to that of commercially cast mild steel. The steel was brought up to pouring temperature, 2 lb aluminum per ton was added and a keel block test coupon was poured for analysis and mechanical tests. Steel at the same temperature was then poured into the ladle containing the desulfurization mixture and a second keel block was then poured from this ladle.

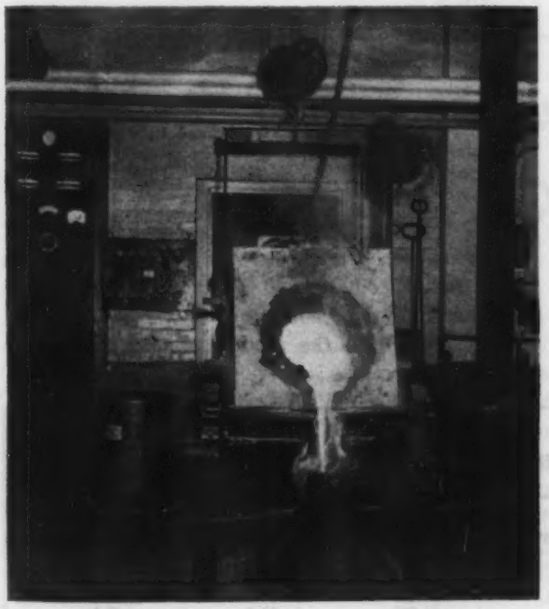


FIG. 2—Ladle desulfurization of a small induction furnace heat.

It should be pointed out that no lime slag was made up in the furnace at any time during the melting procedure. It was found that lime desulfurized the steel in the furnace owing to the stirring action induced by the heating coil. In order to speed up the program, four ladles each holding 80 lb of steel were treated from a 500-lb heat. After each ladle was filled, a keel block was poured directly from the furnace to act as the standard test coupon for that experiment.

Since lime was the main constituent of the slag a series of blanks were run using lime without alloy. Steel was poured into several preheated ladles, each containing 30 lb per ton of cold lime which had been previously dried at 1600°F. The temperature was taken by an immersion thermocouple sheathed in a fused silica tube connected to an L & N Speedomax prior to pouring metal into each ladle. The effect of stirring the lime and metal in the ladle with a steel rod was also determined. No significant sulfur reduction was obtained by lime alone either stirred or not stirred at pouring temperatures from 3002°F to 2912°F.

Commercially pure magnesium turnings were first used in combination with lime for desulfurization. Although a decrease in sulfur was obtained, it was decided that a more friable, less violent alloy would be desirable. After several tests with the aluminum-magnesium series, the 50 pct Al, 50 pct Mg alloy was adopted for more intensive testing. This alloy was used with lime alone and with lime combined with various slagging agents, such as soda ash, fluorspar and borax. Table I illustrates the results obtained.

Having in mind the relatively few variables investigated to date and the fact that only small quantities of metal, approximately 80 lb, have been treated, it will be seen that it is possible to reduce the sulfur content of basic induction

melted mild steel by 0.010 to 0.015 pct, apparently regardless of whether the initial sulfur content is 0.030 or 0.050 pct.

TABLE I

RESULTS OF MG TREATMENT

Lime with Alloy

Pouring Temperature 3002°F

Heat No.	Slag, lb per ton: Lime	Soda	Alloy: lb per ton	Alloy: Mesh size	Results Sulfur, pct: Initial	Final
1184	40	...	4	−28	0.032	0.020
1216	40	...	2	−28	0.051	0.039
1184	40	...	2	−28	0.032	0.021
1184	40	...	1	−28	0.032	0.021
1186	30	...	4	−28	0.029	0.017
1215	30	...	2	−28	0.049	0.038
1186	30	...	1	−28	0.029	0.022
Lime-Soda Alloy						
1194	40	1	4	−28	0.029	0.015
1184	40	1	1	−28	0.029	0.019
1207	30	1	4	−28	0.030	0.018
1186	30	1	1	−28	0.029	0.019
1177	30	1	1	−28	0.050	0.036
1266	20	1	4	−28	0.028	0.021
1268	20	1	2	−28	0.028	0.021
1177	20	1	1	−28	0.050	0.035
Fluid Slag—Alloy						
	Lime	Spar	Borax			
1253	20	4½	1½	10	−28	0.037	0.026
1223	20	4½	1½	6	−28	0.068	0.052
1222	20	4½	1½	4	−28	0.060	0.047
1220	20	4½	1½	2	−28	0.057	0.044
1223	20	4½	1½	1	−28	0.068	0.052
Effect of Particle Size						
1225	30	4½	1½	2	−12	0.055	0.042
1225	30	4½	1½	2	−6	0.055	0.043
1227	30	4½	1½	3	−4	0.051	0.040
1227	30	4½	1½	2	−4	0.049	0.037
1224	20	4½	1½	2	−12	0.050	0.037
1224	20	4½	1½	2	−6	0.049	0.038
1258	20	4½	1½	2	+80	0.032	0.021
Effect of Temperature						
Temp., °F						
1236 3002	20	4½	1½	2	−6	0.041	0.032
1236 2858	20	4½	1½	2	−6	0.040	0.027

A number of samples were taken from treated and untreated steel and examined under the microscope both in the unetched and etched condition. A noticeable decrease in nonmetallic inclusions was observed in the treated samples. This was largely due to the decrease in sulfur content of the steel. Figs. 3 and 4 represent the structures of two samples taken from Heat 1224 in the as-cast condition. Fig. 3 illustrates the untreated steel taken from the furnace. This had a sulfur content of 0.050 pct. It will be noted that stringers of sulfide (Type II)[1] are present

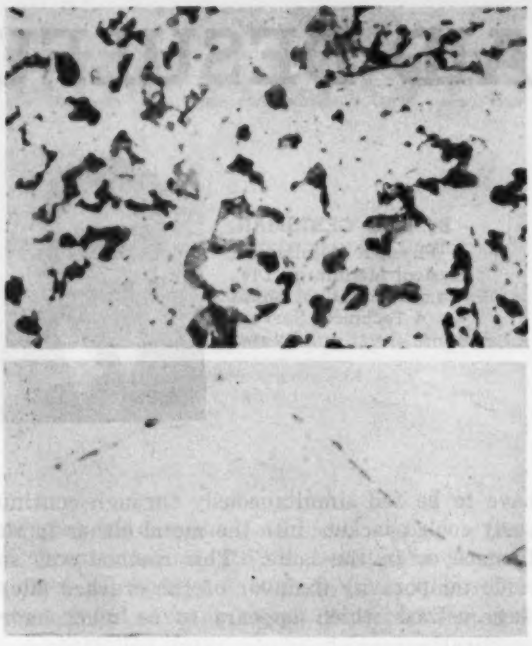


FIG. 3—Photomicrographs of castings untreated, showing grain boundary eutectic sulfide inclusions.

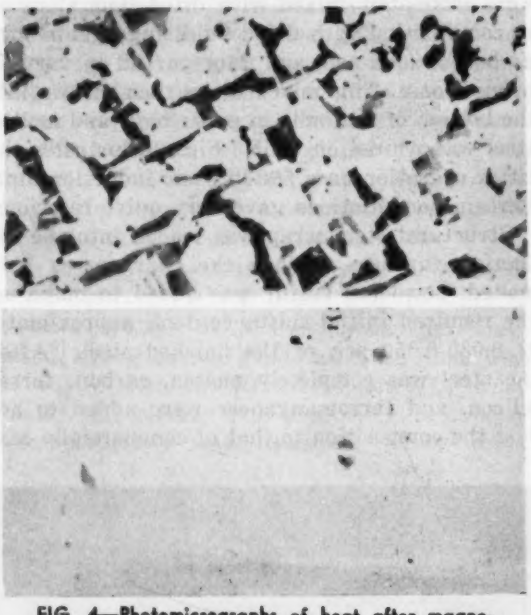


FIG. 4—Photomicrographs of heat after magnesium treated. This is same cast as shown in Fig. 3. Upper photos, 4 pct picral etch, 100X. Lower photos, unetched, 500X.

in the ferrite. Fig. 4 shows the structure of the same heat of steel treated with 2 lb per ton of 50 pct Mg-50 pct Al alloy which treatment lowered the sulfur content to 0.037 pct.

A reduction in the amount of the sulfide in-

TABLE II

EFFECT ON MECHANICAL PROPERTIES

50-Mg 50-Al lb per ton	Initial Sulfur	Final Sulfur	Tensile Strength, psi	0.2 pct Proof Stress, psi	Elong., pct in 2 in.	Reduction of Area, pct
0	0.050	0.050	70,500	41,000	28.0	35.1
3	0.051	0.040	70,800	39,250	30.5	45.1
3	0.049	0.036	69,500	41,000	32.0	43.0
2	0.049	0.037	71,200	41,000	30.5	47.0

clusions and elimination of the grain boundary type has occurred. Sims, Saller and Boulger in their article on "The Effects of Various Deoxidizers on the Structures of Sulfide Inclusions,"[2] indicate that the FeO content of steel affects the type of sulfide inclusions found. Since the magnesium-aluminum alloy is a strong deoxiding agent, this may possibly account for the change in the nature of occurrence of the sulfide.

No change in the grain size could be observed by the McQuaid-Ehn test. This, of course, was due to the fact that 2 lb per ton of aluminum was used to deoxidize the steel in the furnace prior to the ladle treatment.

Table II shows the mechanical properties obtained on 0.505 in. diam test bars turned out of bars which were heated to 1700°F for 2 hr, air cooled and drawn at 1250°F for 3 hr and air cooled. The results of three different experiments using the same heat of steel are given.

It can be seen from the table that an improvement in the ductility properties, elongation and reduction of area, has occurred when the heat of steel was treated for sulfur reduction. Chemical analyses of five heats did not reveal any residual magnesium. Qualitative spectrographic examination, however, showed a magnesium line to be present in several of these, but very faint.

The results shown have all been obtained with small quantities of basic induction melted mild steel. It is anticipated that in commercial use the results will be of a different order depending upon the melting practice, size of ladle and stirring action encountered in pouring the heats from various melting units.

The Steel Castings Institute of Canada is presently testing the magnesium-aluminum alloy in three different foundries where basic open-hearth, basic electric and acid electric arc melting furnaces are employed. Heats varying in size from 1 ton to 50 tons will eventually be tried. The results obtained on these large scale tests should indicate whether sufficient sulfur can be removed with this alloy to warrant its use. The first preliminary test tried in the basic electric arc furnace was carried out by blocking the boil, removing the oxidizing slag and pouring 1 ton of metal into the ladle which contained 20 lb of lime and 2 lb of aluminum-magnesium alloy —35 mesh. No attempt was made to stir this beyond the mixing obtained from the normal drop of the metal to the bottom of the ladle. The sulfur was reduced from 0.066 to 0.050 pct. The reaction was very quiet. Further tests are being carried out to determine the effect of particle size, slags, temperature and stirring on the efficiency of the reaction.

Acknowledgment

The authors wish to express their gratitude to the members of the Research Committee of the Steel Castings Institute and to the member foundries which are cooperating so closely with them on this project.

References

[1] A. M. Portevin, "Rapid Refining by the Ugine-Perrin Method," Metal Progress, April 1949, vol. 55, No. 4, p. 475.
[2] C. E. Sims, H. A. Saller and F. W. Boulger, "Effects of Various Deoxidizers on the Structures of Sulfide Inclusions," Trans. AFS, vol. 57 (1949), p. 233.

Freezing Point of Uranium Determined

THE National Bureau of Standards has very recently determined the freezing point of uranium. Previously, the freezing point was known in a general way but now has been more precisely determined. In the Bureau tests the oxidation of the sample was prevented by using a protective atmosphere of purified helium. When the metal is held just above the melting point for a considerable time, impurities are removed by volatilization and migration to the top and sidewalls of the container. This procedure results in a purity of 99.99 pct and a rise in the freezing point to a constant value of 1133 ±2°C.

In the determination three samples were melted in crucibles identical in size and shape made of beryllia, graphite and thoria. Uranium ingots weighing about 380 g were formed in the shape of the crucible by hot forging and an axial hole was drilled in each ingot to accommodate the black body attachment of the optical pyrometer used to determine the temperature. Uranium was melted in a high frequency induction furnace and the stirring of the molten sample provided a high degree of temperature uniformity throughout. This method of heating minimized the possibility of contamination by furnace elements.

Ford Extrudes Axle Spindles

By HERBERT CHASE

A new forging technique in which automotive axle spindles are extruded results in a 30 pct reduction in scrap, lower die costs, and substantial labor savings. Billets, induction heated to 2250°F, are extruded to shape in a single cavity extrusion die.

EXTRUDED SPINDLE is air-ejected, then lifted from forging press with tongs.

AFTER prolonged experimental work, Ford Motor Co. is now producing spindle forgings for front wheels of passenger cars by extrusion. They are formed in a 1750-ton Maxipress at the company's new forge plant in Canton, Ohio. Instead of using steam forging hammers with the common open die having rolling, blocking and finish impressions, a single-cavity extrusion die is used. At the bottom of this die is a tapered hole. The hot metal is forced into this cavity when the punch applies pressure to the billet. Extrusion action forms spindle.

A single press turns out 300 forgings per hr. Although a trim press is needed to remove flash, this is light as compared with that produced in hammer forging. Spindle forgings produced in 10 to 12 blows of the hammer die lose about 30 pct of their weight. This lost weight is converted into flash. When the hammer forging method was used, this spindle forging flash amounted to some ten tons of steel scrap a day. The hammer billet weighs 7½ lb in comparison with the 5¼ lb extrusion billet.

The extrusion die, Fig. 1, used in the forging press has only a single cavity. The upper part of this cavity makes a close fit with the punch. The billet used is a cylinder of 2½-in. diam and 3 15/16-in. long. It is laid crosswise in the die rather than end up. As the punch strikes the billet, the hot metal is first compressed to fill the upper part of the cavity. Then, as the ram travels further, a part of the metal is forced into the tapered central hole in the die bottom. This action forms the tapered spindle portion of the forging. The metal remaining in the upper cavity constitutes a substantial part of the forging.

The operation of the extrusion setup requires a crew of 16 men. The equipment includes two extrusion forging presses, two 700 kva induction heaters, two trim presses, one restrike press, and two double-wheel grinders. Attaining the same output with the former method took a crew of 46 men operating four 2500-lb steam hammers, four trim presses, five slot type billet heating furnaces, one snag grinder, four slot type fur-

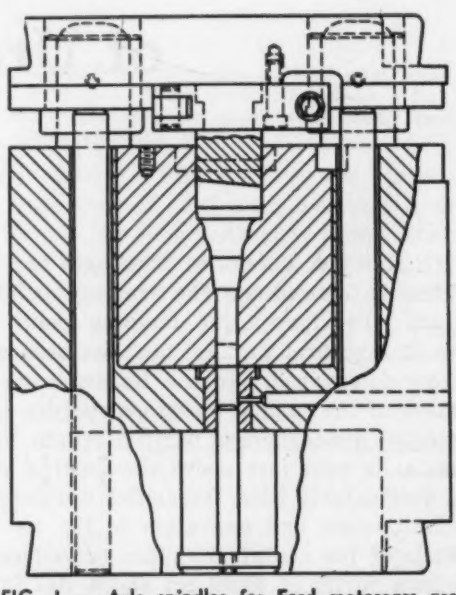


FIG. 1 — Axle spindles for Ford motorcars are forged in this single-cavity extrusion die.

naces for reheating preformed billets, and four restrike presses.

This represents a substantial economy in manpower and machines. There are also other advantages favoring the extruded forging technique. About 80 pct less floor space is needed. Capital investment is lower. Savings in steel are considerable, as previously mentioned. Die costs are lower partly because (1) only one extrusion die is required for two hammer dies, and (2) the extrusion die has a single cavity as against three cavities in the hammer dies. Die life is about the same. About 3500 pieces can be produced before reworking is required.

Billet material is 2½-in. diam SAE 5132 bar stock. Billets are cut in a No. 4 Hilles & Jones shear. They are delivered in stock boxes to the two Ajax continuous induction heaters. These heaters are used alternately, since their capacity of 450 billets an hour exceeds the present 300 per hr extrusion speed of each press. However, each press can produce 450 forgings an hour if die and other conditions permit.

Billets are hand loaded into a chute that feeds the heater. They are automatically ejected from the heater at a temperature of 2250°F. A chute carries the billets to a point where they are picked up by hand tongs and are inserted into the die. When the press cannot keep up with the constant supply of billets issuing from the heater a gate in the chute deflects them to a stock box.

The billets are set horizontally in the die cavity for a more gradual loading of the press as its ram descends. Maximum pressure is exerted during the lower portion of ram and punch travel. This occurs when the press crank nears and reaches lower center, and as it extrudes the hot metal into the tapered hole. The high energy input involved in working the metal raises its temperature considerably. Allowance is made to avoid overheating of the parts. This is accomplished by setting the induction heaters to deliver billets at a temperature such that the additional heat gained in the forging operation will yield the best metal flow conditions without overheating.

As the punch is retracted, an air-operated ejector raises the forging so that it can be lifted out with tongs. It is then pushed out the back of the press into a chute. The part slides down the chute and is deposited on a short elevating conveyer that transfers the forgings to the trim press. As soon as the forging is out of the extrusion cavity, the latter is blown out with an air hose. This helps to remove any scale left in the die. Scale formation is minimized by the use of the fast induction heating.

After being blown out, the die is hand swabbed with a weight proportioned compound, of which 60 pct is M-62 machine oil, 25 pct is Brooks compound, and 15 pct is Ceylon plumbago. This lubricant is believed to have some effect in reducing the heat transfer from billet to die, thereby helping to keep the die from overheating. Blowing out with compressed air also helps to cool the die.

Forgings, Fig. 2, are hot trimmed in a No. 55½ Toledo press. This press is equipped with a die through which the forging is pushed. After being trimmed, the forging drops onto a short conveyer. Trimmed off flash is removed by tongs and is dropped in a hopper. The conveyer carries the trimmed forging to a No. 306 Bliss press. Here the forging, still hot, is restruck in a die and then is pushed into a chute. Next the part falls into a stock box for shifting to a P-5 Ferracute press. On this press the spindle end is cold trimmed to correct length.

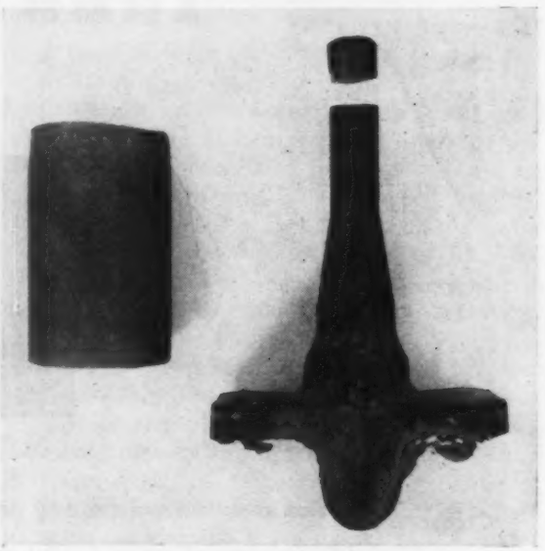


FIG. 2—The billet, left, is used for making the extruded forging. At right is the forging as it appears before flash has been trimmed, but after extruded spindle end has been sheared off.

Before being heat-treated, the forgings are snagged by Hammond double-end grinders. They are then transferred to a slot conveyer on which each forging is visually inspected. Heat-treating consists of (1) heating to 1500°F, (2) quenching in a caustic solution until a temperature between 600° and 400°F is attained, and (3) drawing to yield 302-341 Brinell hardness.

Etched specimens cut from extruded forgings indicate that the fiber flow approximates the ideal and is superior to that attained in hammer die forgings. This is supported by fatigue resistance tests in which average fatigue life of extruded forgings exceeded that of hammer forgings by 17.3 pct. At present, only spindle forgings are being produced in extrusion dies. Parts such as rear axle pinion gears and transmission main shaft gear forgings, whose shapes are favorable for extrusion forging, are under consideration for future production by this method.

A die steel that contains 0.30-0.5 pct C, 0.25-0.60 pct Mn, 0.80-1.20 pct Si, 4.75-5.50 pct Cr, 1.0-1.5 pct W and 1.4-1.8 pct Mo has been found best, to date, for spindle extrusion. These dies are heat treated to 50 Rc.

Galvanizing Water Tanks AT HOTPOINT

By JOHN WALLERIUS, Chief Engineer
Hotpoint Water Heater Div.,
Sunbeam Corp.
Milwaukee

Corrosion resistant galvanizing depends on accurate control of cleaning and fluxing operations and of the zinc dipping process. Furnace design and heat distribution characteristics critically affect surface finish and cost.

MORE steel is destroyed by rust than by any other corrosive action. Protection against rusting can be insured if metal surfaces are positively sealed off from direct contact with air and water. The surface coating selected must be able to resist inter reaction with these agents. The more difficult agent to protect against is water, since its solutions usually contain a multitude of soluble impurities that aid the rusting action. In fact, depending upon geographic location, the various materials with which the water comes in contact determine these solution impurities. Since water heaters are used in all localities, and since their tank bodies are usually made of steel, it is necessary to protect these tanks from the chemical impurities typical of each water type. Galvanizing has been found to be the most practical solution to this problem.

The galvanizing operation consists of (1) the preparation process including cleaning and fluxing, and (2) the dipping process. Control of both phases of this operation is important for satisfactory results.

At the Hotpoint plant, water tanks with diameters from 16 to 20 in. and depths of 16 to 60 in. are zinc coated to eliminate corrosive action and to assure delivery of pure water. Components are the tank body proper and the upper and lower heads. The tank body is formed from rolled sheet steel welded to proper diameter. Then the upper head is weld fastened and the two remaining components are sent through the preparation cabinet. Cleaned parts are galvanize-dipped and then welded to form the final tank.

Preparation of the tank bodies and heads prior to galvanizing is done in a continuous production spray cabinet. Here the work passes through the cycle shown in the accompanying table. The specially designed spray cabinet adapts itself ideally to the continuous, conveyer-type production. Overall dimensions of this unit are 12x50x12 ft. The work enters the cabinet at the ceiling and passes through vapor type spray chambers where the solutions are applied. Location and direction of the spray nozzles in each department is adjusted to assure full coverage of the work. The spray cabinet is enclosed to eliminate fumes as far as possible.

After the surface of the tank parts have been

suitably prepared, they leave the spray cabinet and automatically dip into a zinc ammonia chloride water soluble flux held at 175°F in an open-type tank. Work is then conveyed from the flux to a height sufficiently above floor level to avoid interference with the movements of the operator. The height also permits convenient handling of the larger tank bodies. Tank bodies and heads are now ready for the galvanizing operation.

The travel time from the flux tank to the galvanizing furnaces is long enough to allow the flux to dry to the correct consistency prior to entering the molten zinc bath. A continuous, overhead conveyer line is used to carry the tanks up to and through the galvanizing process.

A high temperature material is used as a flux blanket to minimize oxidation. This blanket covers a large percentage of the bath surface and acts as protection against splattering when the work enters the bath. It also serves as a fluxing agent, assuring a good bond between the iron and zinc.

The work enters the bath and travels the length of the charging side of the kettle, at which point it makes a 180° turn. After this it passes through a flux barrier that prevents excessive blanket flux from flowing into the discharge side of the kettle. Tank bodies and heads are then submerged and drawn through the zinc bath, see Fig. 1. At the point from which the work emerges, the zinc surface is skimmed to assure the best possible suface coat on the tank.

The speed of the conveyer is controlled so that the submersion time in the galvanizing setting is a minute and a half. After the dip, an operator taps the work to remove any excess zinc that may form on bottom edges. The bodies and heads are then conveyed to the assembly department where they are welded together.

TANK BODY PREPARATION

Solution	Time
Alkali spray cleaner	2 min
3-stage rinse	3 min
H_2SO_4 spray pickle	10 min
3-stage rinse	3 min

The galvanized head and tank body assembly are joined in a specially designed hydraulic headsetter. This assures a tight press fit between the component parts prior to welding. The entire assembly is then placed in a special automatic seal welder. Sufficient zinc remains on both sides of the weld on tank and head to give complete protection at this point.

The tanks are continuously spot checked and given weight and thickness checks to assure that a quality coating has been applied. All tanks are given a 300-lb hydrostatic pressure test for leaks and good bond. The units are then placed on the final assembly line where insulating blankets, outer jackets, and other parts are placed around the tank body to make the completed water heater.

The two galvanizing furnaces in use are deep type Sunbeam Stewart furnaces. Their depth of 8 ft 6 in. presented problems in heat distribution not normally encountered with conventional settings.

The Sunbeam Stewart indirect, high side fired furnace together with 20 special nozzle-mixing burners makes it possible to supply an even quantity of heat to the sides of the kettle, see Fig. 2. These burners are capable of accurate flame control, making it possible to obtain the desired flame length while still maintaining a sufficient BTU output. The burners also have a

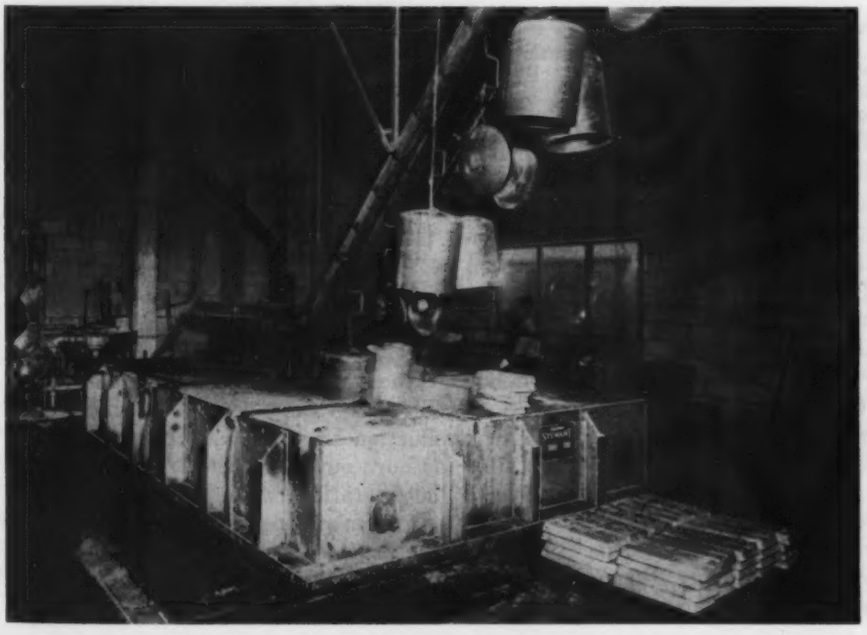


FIG. 1—Water tank bodies and heads enter the galvanizing tank from one direction and emerge traveling in the opposite direction, fully zinc coated.

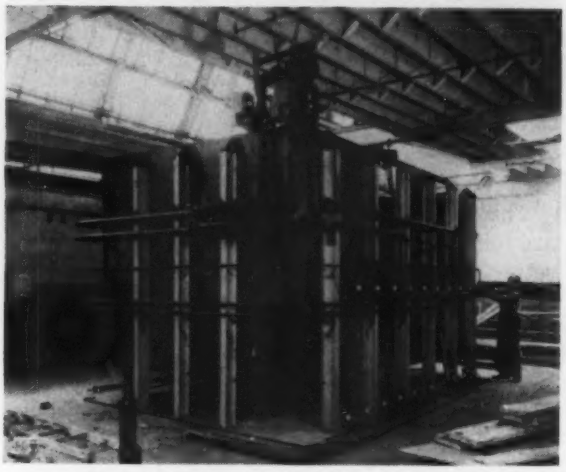


FIG. 2—The Sunbeam Stewart galvanizing furnaces used at Hotpoint supply an even quantity of heat through a depth of 8½ ft.

sufficient turndown ratio to eliminate the necessity of having a second set of burners for idling purposes. The furnace, Fig. 3, is designed to operate in conjunction with an exhaust stack employing a natural forced-draft.

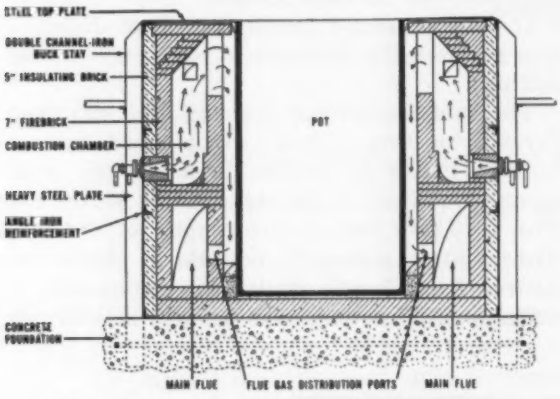


FIG. 3—Section view of the Sunbeam Stewart galvanizing furnace shows how the fuel is completely burned in separate combustion chamber and how the hot products of combustion flow evenly up over a dividing baffle wall to the top section of the pot and then down the side of the pot to exhaust vents.

These installations are operated on undiluted propane gas, which is normally extremely difficult to control. The burners are adaptable to manufactured gas as well as natural gas.

The burner equipment is divided into two zones. Approximately half of the setting is controlled by each zone. Air to gas proportions are automatically controlled by proportioning valves coupled to modulating type control motors and potentiometer controllers.

Combustion chambers are protected against overheating by an additional set of temperature control equipment using thermocouples in the combustion chambers. Overheating during starting and during unusually heavy load periods is prevented by controlling the maximum temperature of the combustion chambers. This extends kettle life. The settings are also protected against air to gas failures by shut-off valves.

Four major factors govern the cost and quality of the galvanize-dip operation: (1) Uniformity of bath temperature; (2) production rate; (3) dross loss; and (4) kettle life. Each of these factors is closely related to, and depends basically on, the design of the furnace.

Uniform Heat Essential

To maintain a uniform bath temperature it is essential that: (1) The pot have sufficient molten zinc capacity so that the cold work does not appreciably affect the temperature of the bath; and (2) the molten zinc be kept uniformly heated.

To insure uniform heating, not only must the rate of heating be uniform, but the heat must be applied uniformly to the kettle itself and at the zone where the heat is required. In the furnace used, the fuel is completely burned in a separate combustion chamber. The hot products of combustion flow evenly up over a dividing baffle wall to the top section of the pot and then down the side of the pot to exhaust vents. Thus no flame can impinge on the pot. The hot gases together with the radiation from the baffle walls evenly heat the kettle from the top down.

Kettle Must Be Adequate

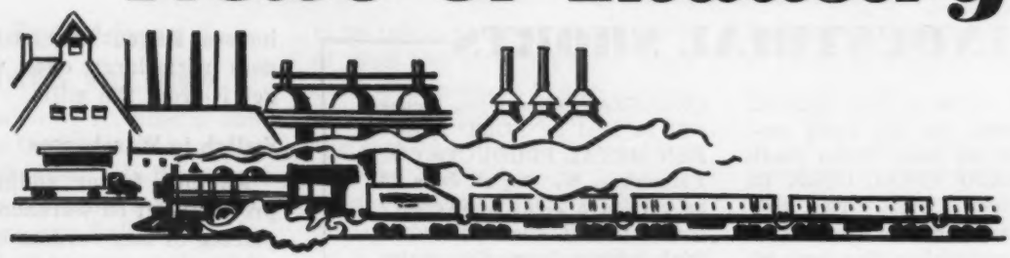
The capacity of the kettle must be sufficient for the required production rate. If the normal production rate is exceeded, the temperature of the combustion chambers will be considerably above that of the zinc bath. This results in short kettle life and increased dross loss.

The kettle must also be correctly designed for the shape and size of the work to be galvanized. The kettle should be large enough so that the work can be easily handled and completely dipped without disturbing the cool bottom area of the kettle where the dross collects.

For minimum dross loss, the setting and kettle must be designed to have a comparatively cool bottom area where the dross settles. It has been found that agitation causing the high-temperature molten zinc to come in contact with the dross greatly increases the rate of dross formation. The indirect, high side fired furnace was designed to provide this cool dross area at the bottom of the kettle. The bottom is kept cold by insulation around the bottom section.

For long kettle life, the rate of production should not cause excessive temperatures on the outside of the kettle. Also, there must be no hot spots or flame impingement on the kettle. High combustion chamber temperatures rapidly oxidize and burn out the kettle. Hot spots cause localized deterioration of the kettle. Excessive combustion chamber temperatures cause the layer of zinc to attack the kettle from the inside. This, because above 890°F zinc rapidly attacks iron.

News of Industry



Higher Spending

Washington — American industry will spend about 3 pct more on plants and equipment in the next 3 months than it did in the comparable 1949 period, indicated the Securities and Exchange Commission and the Commerce Dept. this week. They predicted that third quarter spending will reach $4.5 billion to boost this year's 9 month total to $12.7 billion, or 6 pct under the corresponding '49 period. Previous estimates had indicated an 11 pct drop. Failure of first quarter expenditures to come up to expectations may be related to some extent to loss in steel output because of the coal strike, the agencies said.

Magnesium Shipments Rise

Washington—Nearly double the April 1949 figure and 32 pct over the previous month, net shipments of magnesium wrought products for April were 998,000 lb. Wrought aluminum shipments, however, remained about the same as March, equaling 129,000,000 lb.

To Build Cement Plant in Brazil

Washington—Cia. Nacional, the Brazilian affiliate of the Lone Star Cement Corp., will construct a $4.6 million cement plant near Salvador (Bahia), Brazilian port. Capacity is estimated at 100,000 tons a year.

About $2.8 million represents the cost of American equipment and services which will be financed jointly by the Export-Import Bank and the Allis-Chalmers Mfg. Co.

WAREHOUSES—Good Business and Headaches

Double-barreled task confronts them . . . They must placate irate customers . . . And fight for more tonnage . . . Flat-rolled products are tightest—*By Gene Beaudet.*

Chicago—In a tight steel supply situation the mills have to placate irate consumers. Consumers have to fight for every bit of tonnage they can get. Warehousemen have to do both.

Sheets Move Fastest

With warehouses in the Chicago area averaging about 20 to 25 pct more business so far this year than last year, they say the clamor for their products is higher than at any time since the war. Some expect sales during July and August to double those in the 2 months of last year.

Demand for all products, especially flat-rolled, is high. Sheet inventories just aren't. Sheet deliveries to consumers in many instances are shipped out 5 or 6 hours after they come into the warehouse. When they need further processing they are held over a day or two. A few smaller warehouses in the area have gone into conversion to keep some inventory of sheets.

Remote Orders Trimmed

Next to sheets, plates are the hardest to get. One company in the last few months has spent $40,000 to $50,000 in freight to get plates shipped from eastern mills. Stocks of finished bars are low in most cases with some inventories falling 25 pct below last year's. The movement of stainless is estimated running about double that of 1949. Demand for structurals is good.

Some warehouses executives blame part of their low sheet inventory on the fact that sheet has not risen proportionately with other steel items in the expansion of warehouse products delivered from the mills. Normally, the Chicago area has consumed more steel than it produced and most warehouses have done some business with the East. Now the hardest hit are those which formerly placed considerable tonnages with eastern mills who don't want to send sheets to the Midwest any longer.

Orders Are Boosted

What makes the situation difficult is that many warehouse customers are now in reality mill customers. Accounts that used to order 500 lb to 3 tons of sheets are now asking for 20 to 30 tons. However, they continue warehouse buying because they do not have any standing with the mills who are hard pressed to satisfy demands of customers of long standing.

In one instance, a 5-man fabricating shop that would ordinarily place an order for three tons of sheets put one in for 100 tons. What's happening is that small fabricators, who think they can get the steel from their ware-

INDUSTRIAL SHORTS

MORE JOBS — Five hundred permanent jobs are being created at the East Works plant of ARMCO STEEL CORP. in Middletown, Ohio. The new openhearth plant is expected to be completed late this year at a cost of about $12 million.

PMCO BUYS — Hammermills, Inc., St. Louis manufacturers of Bulldog hammermills and feedmills, has been acquired by the PETTIBONE MULLIKEN CORP., Chicago, as a wholly owned subsidiary corporation. Headquarters for Hammermills have been moved to Chicago.

EASTERN MARKET—A modern manufacturing plant in Somerset, Pa., will soon be established by the DEVILBISS CO., Toledo. The company manufactures air compressor outfits, spray painting equipment and atomizers.

APPROVAL — Approval of the Federal Power Commission has been granted the EAST OHIO GAS CO. to construct 24 miles of 20-in pipeline in northeastern Ohio, from Petersburg to near Youngstown. It will be completed by fall.

FAMILY DAY—June 14 and 15 were Family Days at GRANITE CITY STEEL CO., Granite City, Ill., as the mill held open house. It was a home-town celebration marking completion of the firm's long-range, $22 million modernization program.

CANADIAN AGENT — Lapeer Mfg. Co., Lapeer, Mich., has appointed HIGGINSON ENGINEERING SALES, Hamilton Ontario, as their Canadian distributor. They will carry a complete stock of the Knu-Vise line of toggle-action clamps and pliers.

NEW LOCALE — MOLLA, INC., metal furniture manufacturers, will begin operations at their new center at Fulton Ave. & State St., New Cassel, L. I., on Aug. 1.

CELEBRATING — Open house will be held by FORT STEUBEN METAL PRODUCTS CO., Follansbee, W. Va., on June 23 as part of a 2-day anniversary observance. Business and industrial leaders from five states will be entertained at a reception in Steubenville, Ohio, June 22.

NAMES OFFICERS — Dr. Charles L. Faust, head of electrochemical engineering research at Battelle Institute, Columbus, Ohio, has been named president of the ELECTROCHEMICAL SOCIETY. R. J. McKay, chemical engineer for the International Nickel Co., has been elected a vice-president.

EXPANDING—Construction of a one-story warehouse at 87 Rindge Ave. Extension, Cambridge, Mass., has been started by WARD STEEL CO., Boston. It will be ready for occupancy about October.

MERGER—The Valentine Fire Brick Co., Woodbridge, N. J., has been purchased by the A. P. GREEN FIRE BRICK CO., Mexico, Mo. No change is contemplated in the production schedule or the operating personnel of the newly acquired plant.

CHANGES NAME—Albert & Davidson Pipe Corp., Brooklyn jobbers in iron and steel pipe, valves and fittings, will drop the "Albert" from its name and will be called the DAVIDSON PIPE CO., INC., as of July 1. There has been no "Albert" in the organization for many years.

MOVES — The Pacific Coast plant of PARKER RUST PROOF CO., manufacturers of Bonderite, Parco Compound, Parco Lubrite and other metal preparation and cleaning products, is now in operation at their new location at 3710 Fruitland Ave., Maywood, Calif.

houses, are out competing for orders with large ones who can't get it from the mills.

Switch to Warehouses

Another factor adding to the pressure put on warehouses is the placing of large orders by regular mill buyers. Formerly, most mill buyers were also steady customers of the warehouses. They bought odds and ends in small tonnages from them to round out their requirements, the bulk of which was placed with the mills. Their warehouse buying was consistent but small. Now they are increasing their warehouse orders to make up for cuts in allotments from the mills. They can't be turned away altogether because they ordinarily make up part of the normal pattern of warehouse customers.

Warehouses, unable to satisfy everyone, are trying to do their best by the small tonnage buyer who normally comprises the bulk of their accounts.

Workers Share Savings

St. Joseph, Mich.—The Nineteen Hundred Corp., having set up a standard, has agreed to split 50-50 with its employees any savings made possible through a recently established waste elimination program in which the workers and company cooperate.

The company, which manufactures Whirlpool home laundry equipment, has scheduled production increases of 26 pct in its automatic washers and 33 pct in its electric ironers.

U.S. Steel Exhibit Now Public

Cleveland—U. S. Steel Corp.'s edcational exhibits at the Celler Committee hearings were opened to public showing at Hotel Carter here last week, by American Steel & Wire Co.

One display demonstrates the development of the 162 different types of steel which go into the modern automobile in contrast to the 11 standard types which were employed in 1910.

USS Issues Revised Export Prices on Ternes, Wire, Hoops

New York—U. S. Steel's subsidiary, the U. S. Steel Export Co., has revised some of its export base prices. Freight to New York, Philadelphia, and Baltimore is included and all sales are subject to seller's set conditions of sale.

All prices, now in effect, are net cash subject to adjustment to seller's price in effect at time of shipment from the mill. Prices, per 100 lb unless otherwise noted, are:

Special coated mfg. ternes, unassorted—107 lb basis 14 x 20—112, per base box	$7.08
Bright nail wire	5.02
Black annealed wire	5.62
Galvanized plain wire	5.87
Bright nails and staples	5.84
Barbed wire:	
Glidden 4 pt, 3" or 6"	6.88
Iowa 4 pt, 3" or 6"	6.88
Waukegan 4 pt, 3" or 6"	6.88
Lyman 4 pt, 5", per 80 rod spool	5.90
Tight cooperage hoops	3.94

Plans Warehouse Expansion

Chicago—Chicago Steel Service is planning to construct a new 120,000-sq ft warehouse at an estimated cost of $1,500,000, announced Walter D. Monroe, Jr., president. The new building will include offices and will be located at 45th St. and Kildare Ave.

Blames Scrap Price on Exports

Washington—The Commerce Dept. should "curtail, if not eliminate" government licenses to export steel scrap, Rep. Macy, R., N. Y., urged this week. He declared the licensing of 400,000 tons of scrap for export this year was to blame for pushing scrap prices up to "ridiculous" heights.

Sees Rising Prices

Macy said scrap export quotas set by the department's Office of International Trade now stand at 100,000 tons per quarter. He predicted that the anticipated export of 400,000 tons in 1950 would "effectively offset the expected importation, and will keep the price of scrap at its present ridiculously high price."

"The price of scrap has risen over $20 per ton in the last few weeks and this price rise is bound to be felt in the cost to the public of steel and steel products, since every $10 increase in the price of scrap adds approximately $2.50 to the cost of a ton of steel," Macy told the House.

Last December, a $5-per-ton increase in the price of steel brought on a congressional investigation, he reminded the lawmakers, pointing out that an increase in cost of the same amount now "goes by without notice."

"This is merely one illustration of how harmful inflation is being permitted by our failure to insist that governmental agencies integrate their policies so as to insure the greatest possible benefits to this country," he stated.

Justice Dept. May Ignore Alcoa Rebuff

Judge Knox's thumbs down on Alcoa suit will not deter Justice Dept. from starting steel suit . . . Alcoa case may have set precedent for court action—*By Gene Hardy.*

Washington—Federal District Court Judge Knox's rejection of the Justice Dept. plea to dismember the Aluminum Co. of America will mean little or nothing to the Justice Dept's plans for filing a break-up suit against U. S. Steel, and possibly other large steel producers. This is the view of informed Washington observers. But the view is tempered by the fact that thinking has changed slightly regarding the Justice Dept.'s intentions of filing a steel suit this year.

It is no longer certain that such a suit will be filed. And it appears likely that political considerations will have much influence over the Administration in this regard.

The mere fact that Alcoa was not ordered broken up will not deter the Justice Dept. from filing of such a suit. However, the court's decision in the aluminum case could have a substantial effect on actual court proceedings.

Integration Approved

For example, Judge Knox refused to break up Alcoa with some 50 pct holdings in the aluminum industry, whereas in a dissolution move against U. S. Steel, the court would be confronted with a firm holding only 32 pct of capacity.

In addition, it must not be forgotten that the Supreme Court in June, 1948 approved the purchase of Consolidated Steel Corp. by U. S. Steel largely on the grounds that the purchase was necessary to provide a market for the output of the Geneva, Utah mill.

In other words, the court sanctioned the setup of an integrated operation. In the Alcoa decision, Judge Knox also approved Alcoa's existent integrated setup.

Alcoa Case History

In turning down the Justice Dept.'s petition for the creation of another competitor out of present Alcoa holdings, Judge Knox emphasized the difficulty of such a procedure and pointed out that he was reluctant to risk crippling a

"The boss is right—Clifton here has an excellent head for figures."

firm from which "the public has received substantial benefits."

His decision in effect O.K.'d Alcoa's present status for a period of 5 years, during which time a determination would be made as to whether competition in aluminum created by the war is really effective.

Other points covered in the ruling in this 13-year-old case include: An order of stockholders in both Alcoa and Aluminum Ltd. of Canada, to dispose of holdings in either one or the other of these firms; the dissolution of certain patent agreements; and approval for Alcoa to purchase the war-built aluminum plant at Massena, N. Y.

FIAT Gets More ECA Funds

Washington—The Economic Cooperation Administration has approved $3.5 million more in funds to Italy to be spent for American materials for modernization of the FIAT automotive and machinery plant at Turin. Included were authorizations for $1.7 million for metalworking machinery.

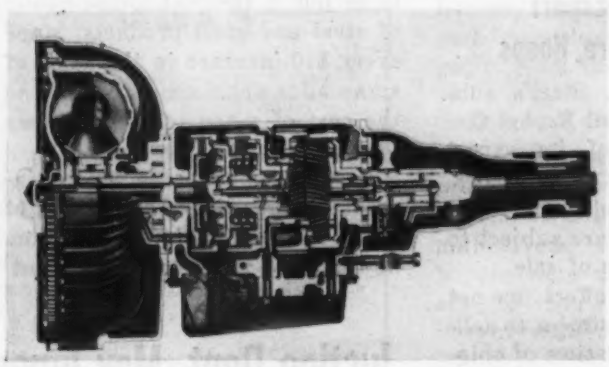
Target of Antitrust Suit

Washington—Dissolution of the Reno Merchant Plumbing & Heating Contractors, Inc., a trade association, is sought in a civil antitrust suit filed by the Justice Dept. in the Carson City., Nev., Federal Court.

The complaint charges that the method of bidding used since 1938 is, in effect, a rigging of prices and that the association has attempted to "prevent sales of plumbing and heating supplies to non-members."

Ship Fewer Cranes, Shovels

Washington—Shipments of excavating and earthmoving equipment in 1949 were valued at $440 million, a 14 pct drop from 1948. Largest decline was in power cranes and shovels, which were down 44 pct to $89 million. Tracklaying tractors, however, gained 17 pct to $113 million in 1949.



FORD CO. automatic transmission—a "blend of torque converter and planetary gearing."

Auto Industry Faces Gas Turbine Question

Engineers recognize struggle of reciprocating engine vs. gas turbine . . . Turbine men confident of eventual victory . . . New Ford transmission described—*By Walter Patton.*

French Lick, Ind. — Prominent automotive engineers who met here last week for their annual summer meeting made it clear that the controversial question of the reciprocating engine versus the gas turbine is an engineering problem that will absorb the interest of the industry for the next 5 to 10 years.

Positions Outlined

It was pointed out that the promised struggle involves the best way to remove the engine and the transmission from the consciousness of the driver—either by an improved reciprocating engine *and* a fully automatic shifting unit or an improved gas turbine that would ultimately eliminate the present automatic devices from trucks and even passenger cars.

Engineers associated with reciprocating engines note that such designs are moving ahead faster today than ever before and that the present car engine is a low-cost, almost trouble-free performer that will be difficult to replace.

Transmission Elimination

Initial obstacles confronting the gas turbine, they say, include high fuel consumption, particularly at idling speed; and high first cost.

Gas turbine advocates are confident that solutions to many of the problems of building a competitive gas turbine are close at hand. Their goal, in addition to other weight savings, is elimination of automatic transmissions.

Raising the transmission question when the industry is investing millions to build more automatic transmissions seems to be rank heresy to many. Still, the question has been boldly raised by gas turbine champions here and they appear confident that the outcome of the struggle will ultimately be in their favor.

Ford Transmission

The prediction was made here that at least one American producer, possibly one of the Big Three, will make a gas turbine passenger car within 6 years.

First disclosure of engineering details of the new 3-speed torque converter transmission for Ford and Mercury was made in a technical paper presented by Harold T. Youngren, Ford Motor Co. vice-president of engineering, and H. G. English, Ford assistant research engineer. The new Ford unit transmits power through a fluid member at all times and does not lock mechanically into high gear.

The new transmission unit was described as "an optimum blend

of torque converter and planetary gearing." The first units will be produced shortly by Borg-Warner which will fabricate and assemble about half of the Ford-Mercury output. He said that volume production in the new Ford transmission plant at Cincinnati is not likely to be reached before the end of the year.

Transmission Parts

Axle ratio with the automatic transmission is 3.31 to 1, as compared with 3.9 for the standard Mercury and 3.73 for the standard Ford. The torque converter has but three stages.

The transmission has 24 aluminum die castings, which include three major components weighing 15 lb. The torque converter uses a die cast impeller cover into which stamped steel blades are recessed. The stator is die cast construction.

No welding or brazing is used to secure blades to the main shell stampings or castings. The new unit will be cooled by circulating air through the housing.

Continental Shipments Up

Detroit—New engine shipments by Continental Motors Corp. are running 23 pct ahead of the same period last year, according to C. J. Reese, president.

During the latest quarter, Continental shipped 110,220 engines. May schedules call for the shipment of approximately 54,000 engines compared with 43,620 in April and 21,808 in May, 1949.

Pipe Valves Put on Export List

Washington—Specialized pipe valves, other than automatic control or regulating, have been added to the positive list of commodities requiring validated export licenses to all destinations.

At the same time, the Commerce Dept. revised the dollar-value limit upward from $100 to $500 which applies to exports of parts, accessories and attachments for power cranes, shovels, trenchers, ditchers, loaders, and excavators.

Tomorrow's big leaguers are on the playgrounds today.

GE Ties Future Sales to Civic Improvement

Program called More Power to America . . . Latest facet is Outdoor Recreation . . . No early payoff expected . . . But GE has faith that sturdier America will mean sturdier GE.

New York—Farsighted General Electric Co. has tied part of its future sales potential to a long-term program of civic improvement. The continuing program is called "More Power to America," and its latest facet is "Outdoor Recreation."

General Electric has a lot of faith in this program. It has to have because it is costing them plenty. The company knows that the program won't pay for itself in a year or even 5 years. But it is gambling on its conviction that what builds a sturdier America will also build a sturdier General Electric Co.

Cites Advantages to Industry

The company isn't at all coy about its reasons for sponsoring an outdoor recreation program. "It's just plain good business." An ultimate aim of the program is to sell General Electric lighting for ball fields, recreation centers and playgrounds. But the program is so designed that selling as a benefit to GE comes along after the community has already benefited.

The program devotes careful attention to the advantages of recreation to modern industry. It includes such topics as: "Why Industrial Recreation Pays Off," "How to Get a Recreation Program Started" and "What It Includes."

Allies Join GE

A feature of the program is a 20-min film which was previewed here recently. Aptly titled "A Chance to Play," it was produced for GE by The March of Time under technical supervision of the National Recreation Assn. It is supported by quantities of booklets designed to aid community and industrial leaders in planning better recreation.

GE has a host of allies helping them with this worthwhile project. They range from the director of the National Recreation Assn. to the community leaders and from company presidents to employee representatives. Although GE has launched the program, these business and civic leaders are helping to assure its success.

Joe Prendergast, executive director of the National Recreation Assn. gave the program a big boost

at the recent preview of the film when he said: "Just as Wellington believed Waterloo was won on the playing fields of Eton, so I believe the second World War was won, and the present 'cold war' will be won, on the playgrounds of America. . . . The spontaneous cooperation of a free people has its source on the playground."

Promoting the public welfare is not merely a philanthropic gesture. Here's how a GE spokesman describes their motives. "We believe in this cause as fervently as our allies. With them, and any others whose alliance we can muster, we intend to beat the drums for better recreation facilities. And after those facilities start coming along, then we'll start thinking about sales."

NSPE Picks New Head

Boston — Sidney L. Stolte, St. Paul, Minn., architect and engineer, was elected president of the National Society of Professional Engineers at their annual convention at the Hotel Statler on June 10.

Firms Agree to FTC Order

Washington—Sixteen corn products manufacturers charged with price fixing and other discriminatory practices before the Federal Trade Commission agreed last week to a proposed consent order similar to the one that settled the steel case.

Now under consideration by the trial examiner, the order provides that the firms agree not to engage in "any planned course of action" or understanding which would fix or maintain prices, terms or conditions of sale; establish a zone or basing point price system; refusal to quote, sell or deliver products f.o.b. the production point; or use any price reporting plan to reduce competition.

While the firms do not admit the findings and conclusions of the FTC, they would agree not to appeal if the order is entered.

Chicago Industry Follows Expansion Trend

Area's metalworking field manufacturers will spend $9 million ... Three times as much set aside in '50 as was spent in first 5 months of '49 ... Crescent plans new headquarters.

Chicago—Manufacturers in the metalworking field will spend an estimated $9 million of the $12 million which 29 Chicago district companies announced in May will be invested in expansion and building, reports the Chicago Assn. of Commerce and Industry.

Expansion Trend

The added manufacturing facilities promises to lend even greater impetus to the hot demand for steel products by the six county districts surrounding Chicago. Among the steel products consumers planning expansion were steel fabricating, television, tractor, and refrigerator manufacturers.

Their expansion planning follows the trend of Midwestern industries, which in the first 5 months of '50 proposed to spend nearly three times as much for industrial facilities as they did in the same period for '49. The 1950 investment was $119 million as compared with $42 million for the first 5 months in 1949, reports the association.

In one of the largest projects, the Crescent Industries, Inc., Chicago, producers of radio speakers, record changers and a line of tools, dies and stampings, will soon start construction of a 144,000 sq ft plant, in which they eventually hope to house the entire operations of the company.

A. O. Smith Factory

Rheem Mfg. Co., fabricator of steel drums and hot water tanks, is constructing a 65,000 sq ft addition to its present Chicago plant. Motorola, Inc., has acquired a new building containing 200,000 sq ft of space which it will operate as a branch plant.

Reports by Midwest manufacturers outside the Chicago industrial area indicate that the expansion of industrial facilities is pretty widespread. The above figures do not show spending outside the counties of Cook, DuPage, Kane, Will, Lake (Ill.) and Lake (Ind.), surrounding Chicago.

The following are a few of the expansions announced recently: The A. O. Smith Corp. is spending a half million dollars on the construction of a 60,000 sq ft factory at Tipp City, Ohio, for the manufacture of fractional horsepower electrical motors. To be known as the Eastern Motor Div. of A. O. Smith Corp., the plant

WORLDS TO CONQUER: This team of young college men is serving in various sales offices of the Electric Controller & Mfg. Co., Cleveland. They completed a 12-month training program at the home office prior to being eased into industrial selling.

expects to be in operation in September.

Noblitt-Sparks Industries, Inc., Columbus, Ind., has started construction of a 90,000 sq ft plant for the manufacture of television sets. About $200,000 is being spent on plant expansion and improvement by the LaCrosse Cooler Co., LaCrosse, Wis., to double the plant's capacity of beverage coolers and dispensers.

Warns Against Taxes, Spending

Lebanon, Tenn.—Excessive taxation is threatening "profit and opportunity" in America and continuance of spendthrift Federal policies will eventually "strangle" the nation's economy, T. M. Girdler, chairman of Republic Steel Corp. said at a recent commencement exercise of Cumberland University here.

Coal Researchers Get New Head

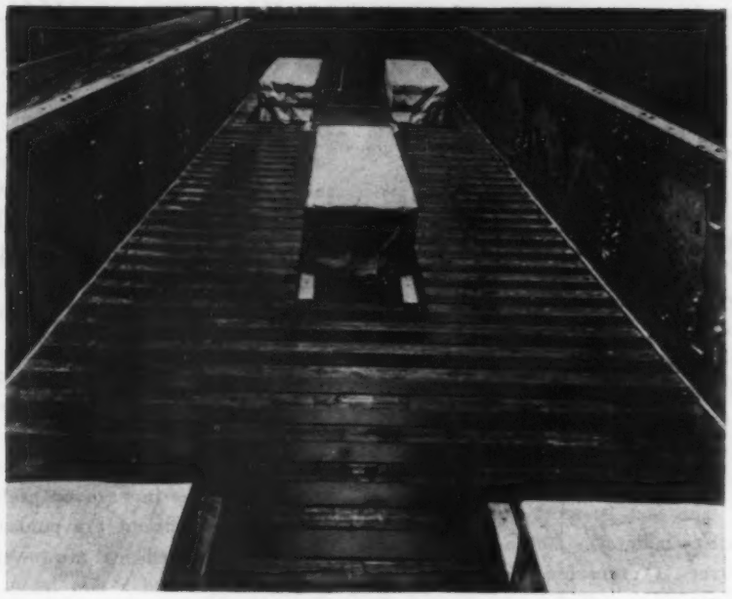
Pittsburgh—The Board of Directors of Bituminous Coal Research, Inc., recently announced the election of Dr. A. A. Potter, Dean of Engineering of Purdue University, as president of BCR on a part-time basis. He is widely known for his work in research and education in fuel and power generation.

Ship Sold on Scrap Basis

New York — Recent skyrocketing trends in the scrap market permitted the sale of the Norwegian Flag Tanker, Dixiano, on a scrap basis for almost as much as would have been possible if it had been sold for use. It was the fifty-eighth ship purchased by J. C. Berkwit & Co. in 2 years.

British to Study American Way

Washington—A 17-man British delegation from the nonferrous metals industry was scheduled to arrive in the United States on June 14 for a 6-week study of American methods and techniques. A definite schedule for plant visits has not been announced.



New Freight Car Floor

Middletown, Ohio — Timber was nudged half-way out of another industrial application by a new type of freight car flooring developed by Armco Steel Corp. A composite steel and wood floor for box cars, gondolas, and flat cars, it blends advantages of both to offer greater strength, longevity, and eventual lower cost in meeting the requirements of modern loading methods, Armco claims.

Hat-shaped steel ribs placed across the width of the car and welded to the center sill, stringers, and side sill angles are alternated with wood planks bolted to rib flanges. The top surfaces of the hat sections extend slightly over the wood planks and bear the brunt of service and load. Steel planks, tack-welded to the ribs, are used where it is impossible to bolt wood planking. Overall cost of the flooring will be about 45 to 50 pct less than conventional wood flooring, estimates Armco, on the basis of a 25-year car life.

Construction for '50 Climbs

Washington—With construction activity for the first 5 months running a fifth more than for last year, the total for 1950 now seems likely to exceed the most optimistic forecasts.

May contract construction set a new record of more than $1.9 billion to bring the total for 1950 to nearly $8.1 billion. Private building at $6 billion was up 22 pct over last year and public construction, at $2 billion, was 19 pct greater. Residential building was going into place at a 50 pct greater rate.

Stockholders Approve Pension

Philadelphia — Three pension plan proposals were approved by stockholder voting recently, said Edward G. Budd, Jr., president.

The pension plan providing $68 a month, plus Social Security payments to Hunting Park plant workers 65 years old with 25 years' service was approved. A contributory pension plan for higher bracket personnel was also approved and authority was voted to the board of directors to extend pensioning to uncovered employees and to modify, extend, or end any plans or programs.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Canute and the Cyclical Waves"

HOWEVER confident the advisers in the inner temple of the government may feel regarding the business future, it is a feeling not shared generally by businessmen. This does not mean that business is sour. Quite the contrary. Reports from the economic front, with few exceptions, are good.

The fact is, most business executives believe in the adage that one error is excusable, but the same error must never be committed a second time. The current generation of business leaders remembers the '20s and the '30s. In both periods a new era psychology had captured the minds of many observers. In the '20s this mood was generated by private groups under the influence of an unprecedented stock market boom. In the '30s it was sparked by the confident assertion of the President, "We planned it that way."

With the fallacy of this theory twice demonstrated within a generation our hard headed industrial and financial leaders refuse to relax. They properly regard the arguments that it can never happen again as so many polemic opiates which must be rejected.

Some of these arguments are highly plausible.

In the first place, it is urged that we cannot afford another depression. That the American government under the stark need of self-preservation will not permit any substantial business decline.

Whether we can afford it or not is a moot question in political tactics and economic theory. When a government pledges prosperity and full employment so unreservedly that this becomes a condition of continued tenure, any slump might prove damaging, though not necessarily fatal to the party in power. The other side of this particular shield, vigorously expounded by the opposition, is that a slump may be a low price for the country to pay to "turn the rascals out."

Economically, a slump is the only way in which a free economy operating through open markets and unhampered personal choice can register changes in need or preference. The inefficient are punished by failure. The efficient are rewarded by survival and a new lease on life. This treatment may be rugged, but it is the way of progress.

The second broad argument that we cannot have another major slump deals with the specific barriers against disaster which have been evolved in the last generation.

The bank failures of the '20s and early '30s cannot be repeated. Changes in banking practice, a 50 pct reduction in the total number of banks, and deposit insurance, make mass bank failures virtually impossible. The F.D.I.C. today has an accumulated "safety fund" which together with its borrowing power of $3 billion is more than twice the total losses sustained by depositors since the end of the Civil War.

Wall Street is almost entirely on a cash basis. There is little danger of a collapse either in the stock market or in business because of tight credit. The farmer is insured against disaster by a series of benevolent road blocks against price collapse. Unemployment insurance and a highly organized relief system are guarantees of minimum consumption standards.

These are all safety devices which will temper the impact of the storm upon the individual. To assume that they will avert the tempest altogether is asking too much.

Bethlehem Plans $32,000,000 Spending in Its Johnstown Plant

Steel ingot capacity to be raised 15 pct . . . Pig iron output to rise.

Johnstown, Pa.—Bethlehem Steel Co. will invest $32,000,000 to expand and modernize its plant here to offset production handicaps of location and topography and prevent the plant from slipping into the ranks of marginal producers, Arthur B. Homer, president, told the Johnstown Chamber of Commerce last week.

The project will entail increasing steel ingot capacity by nearly 15 pct, lifting coke and pig iron capacity, and making rolling mill and auxiliary improvements.

Ingot Capacity Increase

Mr. Homer said that steel ingot capacity would be raised from a present annual rate of 1,900,000 tons to 2,160,000 tons by increasing the individual capacity of all Franklin openhearths from 135 to 150 ton heats. Six of the furnaces have already been altered and the remaining 15 will be completed in less than a year and a half, he said.

Pig iron capacity of Franklin blast furnaces will be stepped up 216,000 tons by enlarging three of the five Franklin blast furnaces and installing more efficient blowers, more stove capacity, and gas cleaning equipment.

New Blooming Mill

The Bessemer converters and the 48-in. blooming mill at the Lower Works will be taken out of operation and the 18-in. billet mill there will go to Franklin. Two blast furnaces at the Lower Works will make ferromanganese only.

Expanded coke producing facilities at Franklin will have an output of 112,000 tons of coke per month. It is now 76,000 tons. The two Lower Works blast furnaces will draw coke from Rosedale.

A new high-lift 54-in. blooming mill will supplement Franklin's 40-in. blooming mill and 34-in.

billet mill and the relocated and modernized 18-in. billet mill. It is also planned to scrap the 34-in. slabbing mill and move the 134-in. plate mill in its place.

Now being built is a single group of 30 large modern soaking pits to replace smaller units. Completion is expected in 14 months. Also contemplated was the erection of a modern 20,000 kw turbo-generator to supply extra power needed.

NSMPA Officers Elected At Bedford Springs Meeting

Cleveland—New officers of National Screw Machine Products Assn., elected recently at the Spring meeting in Bedford Springs, Pa., are: president, C. E. Lucas, Lucas Screw Products, Rochester; vice-president, H. F. Fischer, Fischer Special Manufacturing Co., Cincinnati; and treasurer, Willian N. Grass, M. J. Grass Screw Machine Co., Buffalo.

New directors of NSMPA elected for 2-year terms are: Otto Albrecht, Babson-Dow Manufacturing Co., Roxbury, Mass.; E. A. Bartlein, Western Machine Company, Milwaukee, Wis.; Keith E. Brooks, Huron Automatic Screw Co., Pt. Huron, Mich.; S. E. Casson, (Detroit Office) National Acme Co., Cleveland, Ohio; Harold C. Close, Waterville Manufacturing Co., Waterville, Conn.; George L. Hunt, Hunt Screw & Mfg. Co., Chicago, Ill.; Ralph H. Lightner, Titan Metal Mfg. Co., Bellefonte, Pa.; and Carl R. Wedler, Jr., Wedler Bros., Inc., Cleveland, Ohio.

RR Orders Diesel-Electrics

St. Louis—The Missouri-Kansas-Texas Railway has ordered diesel-electric locomotives costing about $2,200,000 as follows: two 4500-hp passenger and two 1600-hp road switchers from American Locomotive Co., and eight 1600-hp road switchers from Baldwin Locomotive Works for delivery in September. The road also ordered 100 70-ton covered hopper cars from Pullman Standard Car Mfg. Co.

THOUSANDS WILL SEE IT THIS SUMMER at Atlantic City Central Pier...

. . . the roof drainage equipment on the Log Cabin and Cape Cod House is fabricated from *MicroRold* stainless steel

These sturdy and long-lasting roof drainage products fabricated from MicroRold Stainless Steel for CAMPBELL STAINLESS PRODUCTS CO., Washington, Pa., add distinction and beauty to any building with their smart new designs. They won't rust, corrode, or discolor sidings or window frames. And they never require maintenance.

But best of all, the initial cost of Stainless Steel roofing products is lower than that of some other widely-used metals. And figured on a long-term basis, it is less expensive than even the cheapest used, because Stainless Steel is so durable that it will last as long as the structure on which it's installed.

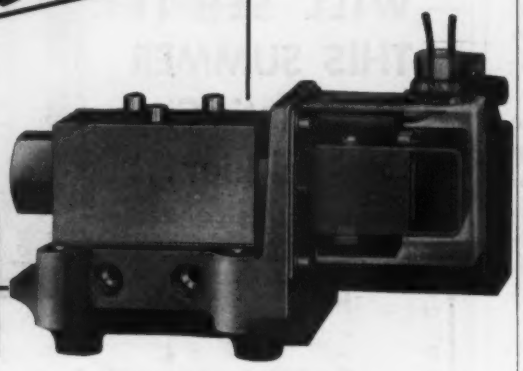
MicroRold Stainless Steel sheets are now being rolled up to 36" wide as light as .010" in thickness and sheets 30" wide as light as .005" with amazing uniformity of gauge.

WASHINGTON STEEL CORPORATION
WASHINGTON, PENNSYLVANIA

NEW INEXPENSIVE

High Cycle SOLENOID VALVES

1/8" and 1/4" sizes up to 300 cycles per minute



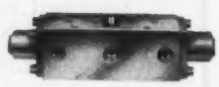
. . for air to 125 P. S. I.— or vacuum also low pressure hydraulic service

● These valves combine the utmost simplicity in design with rugged construction. They will give millions of cycles of highly satisfactory and efficient trouble-free service. Small solenoids, with short strokes work against the valve plunger, eliminating levers, links and pins. Low amperage requirement eliminates intermediate relays and simplifies electrical control circuits. Side or bottom pipe connections. Valve body and solenoid are both mounted on an aluminum base and can be removed without disturbing the piping. 2, 3, 4 and 5-way actions. ***Write for Data Sheet No. 1741.***

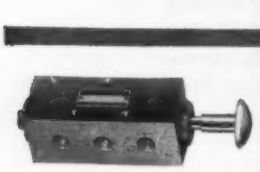
Individual DATA SHEETS for Each Valve —give complete details. Write today!

Hand Operated Air Valves—wide variety of uses. 2-way, 3-way, 4-way neutral position and compound exhaust.

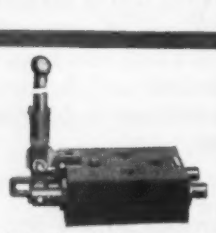
Foot Operated Air Valves—workman has both hands free, speeding production. 2-way, 3-way and 4-way actions



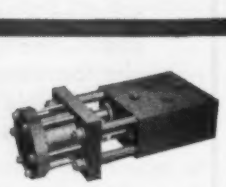
Single Plunger Valves—for air or low pressure hydraulic service. Lever, pilot, cam, diaphragm or solenoid operated. 2-way, 3-way, 4-way actions.



Series "O" and "OE" Valves—for air or hydraulic service up to 125 PSI. Push-pull, cam, pilot, diaphragm and solenoid operated. 1/8" and 1/4" pipe connections. 2-way, 3-way, 4-way and 5-way actions.



Hydraulic Valves—Up to 5000 PSI. Conservatively rated. 1/2", 3/4", 1" and 1 1/2" sizes. 2-way, 3-way, 4-way actions.



Hydraulic Valves—Up to 5000 PSI. Pilot cylinder operated. 1/2", 3/4", 1", 1 1/2" 2", 2 1/2" 3" and 4" sizes 2-way, 3-way, 4-way actions.

Quick-As-Wink Control Valves

THE HIGHER THE PRESSURE THE TIGHTER THE SEAL

Manufactured by **C. B. HUNT & SON, Inc.**

1913 East Pershing Street, Salem, Ohio

Rheem to Spend $4,250,000 In Expansion, Product Development

New York—This year's expansion and product development plans of the Rheem Mfg. Co. will encompass launching of volume production of steel containers with the new Rheemcote color lithography process and new fabricating methods, and enlargement of the Chicago plant producing residential gas heating equipment.

Cost of the program was set at $4,250,000 by R. S. Rheem, president, at a Waldorf-Astoria twenty-fifth anniversary press conference last week. Another facet of the program was establishing the 40 pct-Rheem-owned Bristol, England, plant to produce steel containers, he said.

Optimism for Gas

About $3,500,000, will be spent in extending the Rheemcote process which permits detailed color lithography on 55 gal steel drums.

Mr. Rheem noted that his firm had an "exclusive" in the sense

Process details on page 99

that Rheem was the only firm at present with technological facilities able to do the job.

Expressing optimism in the future use of gas as the lowest-cost most widely-used fuel, Mr. Rheems announced that $600,000 will be spent to double the capacity of the Rheem Chicago gas heater plant in 1950 and triple it by 1951.

Establishment of the Bristol drum plant stems from the abandonment of the uneconomical Amsterdam plant, Mr. Rheem stated. He foresaw no serious difficulty of obtaining sheet steel with completion of new English mills.

Lauds Freight Legislation

Chicago—Although Inland Steel Co. lies within the lowest freight area, Edward L. Ryerson, firm chairman, said last week that passage of the freight absorption bill by Congress was a sound and constructive move. He said that it preserves the right to compete.

Martin Process Gives Steel Wear Resistance to Aluminum

Baltimore—Abrasion resistance of aluminum has been tremendously increased by an oxide process just announced by the Glenn L. Martin Co. The oxide film, applied by an electrochemical process, also improves the metal's transient resistance to heat.

According to C. C. Pearson, president, coatings have been successfully applied to items such as gears and pinions, surveying instrument parts, turbine impeller blades, hand tools, high-speed leading edges, and paraplegic leg braces, all of which require extreme wear resistance.

The coating consists of a nonmetallic, highly heat-refractive surface ranging from .0001 to .006 in. of thickness (.002 in. is usually used for abrasion-resistant purposes). Surface smoothness, in general, is maintained by the processing. The hardness of the coating may be considered "file hard."

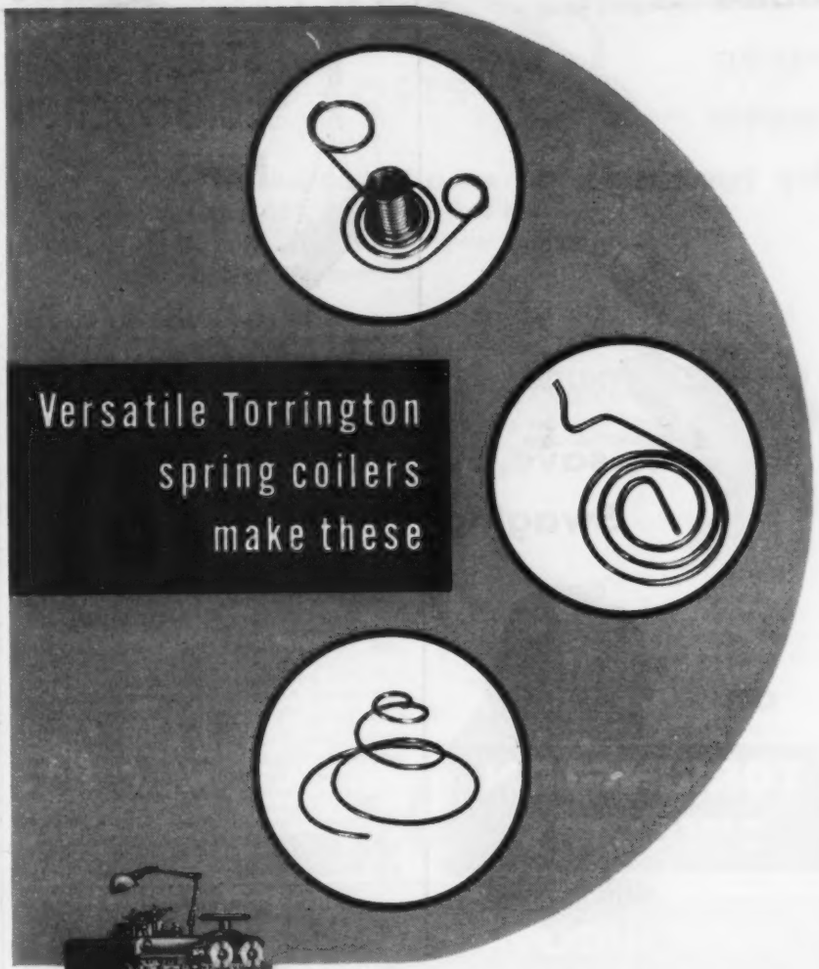
UAW Rejects Pension Offer

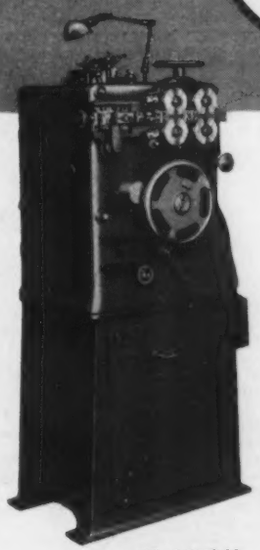
Chicago—The CIO United Auto Workers Union has rejected a noncontributory plan offered by the International Harvester Co. The plan called for a $100 monthly pension after 25 years' service if a worker reached the age of 65 years. The pension fund was to be administered financially by a trustee, with a board composed of company and union representatives to pass on the eligibility of pension applicants.

April Aluminum Output Dips

New York—April primary aluminum production was only a shade below the peak figures of March, announces Donald M. White, secretary of The Aluminum Assn. Production in April, a shorter month, was 116,048,542 lb as compared with 117,493,525 lb for March.

Aluminum sheet, strip, and plate shipments dipped to 90,816,431 lb in April from 11,558,806 in March.





Model W-11, one of fourteen versatile Torrington Spring Coilers

SPECIFICATIONS

Wire Diameter Range: .015" to .072"

Wire Length per Spring: 0" to 42" (Extra Wire Feed Gears Available)

Coil Range (O.D.): 3/32" to 1-9/16"

Production: 23 to 190 springs per minute with variable speed drive

Torsion and other attachments available.

PLUS an amazing range of other intricate springs that meet the most exacting requirements. Professional springmakers from coast to coast agree that a Torrington Spring Coiler can't be beat for speed, accuracy and economy. Your professional springmaker who owns a Torrington spring coiler can make springs to your special needs. If you're uncertain about a source of supply for a special spring you want, our sales department will help you find it or help your springmaker devise tooling to produce it.

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The Torrington Rotary Swaging Machine uses every bit of stock. With 4000 hammer blows a minute, swaging reduces, sizes, rounds, tapers and points rod, wire and tubing. It makes metal tougher and more resilient. It hammers away minor surface defects.

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News of Industry

STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

3489 Tons, Providence Providence-Olneyville Expressway, R. I. M. A. Gammino Construction Co., Providence, low bidder.

3300 Tons, Middlesex County, N. J., New Jersey Turnpike Authority, Contract 34, Rosenblum Contracting Co., New York, low bidder.

2200 Tons, Portland, Ore., steel towers, Bonneville Power Administration, to Bethlehem Pacific Coast Steel Corp.

1500 Tons, Burlington - Mercer Counties, N. J., New Jersey Turnpike Authority, Section 3(36), George M. Brewster, Bogota, N. J., low bidder.

600 Tons, Reading, Pa., bridge for Reading Co., to Phoenix Bridge Co., Phoenixville, Pa.

600 Tons, Scranton, Pa., high school stadium, Pittsburgh-Des Moines Steel Co., Pittsburgh, low bidder.

430 Tons, Salem & Gloucester Counties, N. J., New Jersey Turnpike Authority, Section 1(24), Peerless Construction Co., New York, low bidder.

300 Tons, Union County, N. J., New Jersey Turnpike Authority, Section 6(25), Poirier & McLane, New York, low bidder.

260 Tons, Chicago, Congress Street Substructure, M. J. Boyl Co., contractors, to American Bridge Co.

202 Tons, San Benito Co., Calif., bridge and highway construction between Chittenden Rd. and one mile north of San Benito River, through Granite Construction Co., Watsonville, Calif., to Consolidated Western Steel Corp.

150 Tons, Cadiz, Ohio, Pennsylvania Railroad bridge, to American Bridge Co., Pittsburgh.

150 Tons, Glenside, Pa., addition to building, Prock Cabinet Co., to Bethlehem Steel Co., Bethlehem.

150 Tons, Chicago, New York Central Railroad Turntable to American Bridge Corp.

131 Tons, East Hartford, rolled beam bridge. Brunalli Construction Co Southington Conn., low bidded.

100 Tons, Philadelphia, Wingahocken St. bridge, City of Philadelphia, to American Bridge Co., Pittsburgh.

Fabricated steel inquiries this week included the following:

1980 Tons, Burlington-Mercer Counties, N. J., New Jersey Turnpike Authority, Section 3(37), due June 29.

1200 Tons, Lancaster, Pa., bridges, Penn sylvania Dept. of Highways, due June 30.

900 Tons, Harrisburg, hospital, postponed to June 22.

500 Tons, Ardmore, Pa., admission building, Philadelphia Electric Co., due June 15.

500 Tons, Burlington - Mercer Counties, N. J., New Jersey Dept. of Highways, due June 26.

350 Tons, Essex & Passaic Counties, N. J., New Jersey Dept. of Highways, due June 26.

297 Tons, Allegheny County, Pa., State Highway & Bridge Authority, LR-765, due June 30.

297 Tons, Allegheny County, Greentree Borough, construction of two I-beam bridges and a deck plate girder. State Highway & Bridge Authority, Harrisburg, Pa. Bids to June 30.

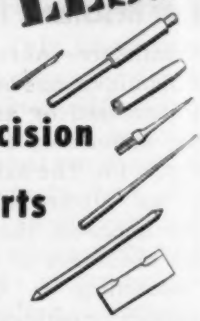
152 Tons, Loveland, Colo., Carter Lake Pressure Tunnel, Bureau of Reclamation, Denver, Spec. 3081, bids to June 27.

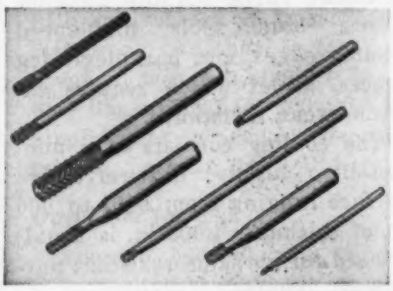
Reinforcing bar awards this week included the following:

1250 Tons, Philadelphia, medical center, University of Pennsylvania, McClos-

IT COSTS LESS

to have your precision metal parts made by TORRINGTON





Special equipment and volume production enable us to save for you on a wide variety of precision parts made to order.

Typical are mandrels or spindles for mounted grinding wheels, abrasive points, felt wheels. Shank diameters to .500", close tolerances, centerless ground if desired. Chuck ends rounded, no burrs. Sharp, clear uniform knurls. Concentric tapers. Mandrels accurately hand-straightened.

Send your prints and specifications today for a prompt quotation, and ask for a copy of "Precision Metal Parts".

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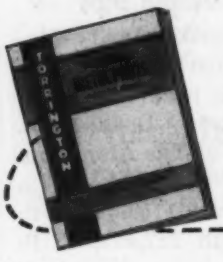

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key & Co., Philadelphia, low bidder.

1132 **Tons,** Providence-Olneyville Expressway, R. I. M. A. Gammino Construction Co., Providence, low bidder.

655 **Tons,** Berkeley, Raynham and Taunton, Mass., Boston-Fall River Expressway, Campanelli and Cardi Construction Co., Hillsgrove, R. I., low bidder.

500 **Tons,** Norristown, Pa., sewage treatment plant, through Robert E. Iamb & Son, Philadelphia, to Amerlux Steel Products Corp., New York.

440 **Tons,** Champagne-Urbana, Ill., Animal Science Bldg., University of Illinois, to Laclede Steel Co., St. Louis.

335 **Tons,** Chicago, Terminal Building Hanger B, O Hare Field, to Truscon Steel Corp.

320 **Tons,** Cincinnati, water works improvement to Pollock Steel Co., Cincinnati.

315 **Tons,** Allegheny County, Pa., Pennsylvania Turnpike Section 31-C, to U. S. Steel Supply Co., Chicago.

270 **Tons,** Merced, Calif., Merced general hispital, through Dahs Construction Co., Fresno, to Richards Steel Co., Oakland, Calif.

235 **Tons,** Minneapolis, Wold Chamberlain Field, to Laclede Steel Corp., St. Louis.

220 **Tons,** Chicago, Franciscan Order Church and Priory, to Jos. T. Ryerson and Son, Chicago.

215 **Tons,** Chicago, American National Bank and Trust Co., to Jos. T. Ryerson and Son, Chicago.

210 **Tons,** Chicago, Presbyterian Hospital Nurses Home, to U. S. Steel Supply Co., Chicago.

210 **Tons,** South St. Paul, Minn., high school to Bethlehem Steel Corp.

200 **Tons,** Elverta, Calif., transmission tower construction between Cottonwood and Madison, Bureau of Reclamation, Elverta, Spec. 2947, to Gilmore Fabricators, Inc., Oakland, Calif.

200 **Tons,** Wayzeta, Minn., school, to Ceco Steel Products Co., Chicago.

175 **Tons,** San Benito Co., Calif., bridge and highway construction between Chittenden Rd and one mile north of San Benito River, through Granite Construction Co., Watsonville, Calif., to San Jose Steel Co.

170 **Tons,** Bismarck, N. D., William Moore School to Cowin Co.

160 **Tons,** Lincoln, Minn., elementary school to U. S. Steel Supply Co., Chicago.

140 **Tons,** Milwaukee, Prospect Heights Apts. to Truscon Steel Corp.

140 **Tons,** Madison, Wis., Camp Randall Stadium University of Wisconsin, to Bethlehem Steel Corp.

125 **Tons,** Lake Forest, Ill., water works improvement to Jos. T. Ryerson and Son, Chicago.

115 **Tons,** St. Paul, Bank Building addition to Bethlehem Steel Corp.

110 **Tons,** Chicago, Monroe Street Parking Deck, to Jos. T. Ryerson and Son, Chicago.

110 **Tons,** Freeport, Ill., Deaconess Hispital, to Ceco Steel Products Co., Chicago.

110 **Tons,** Westmoreland County, Pa., Belle Vernon Bridge to Ft. Pitt Bridge Co.

100 **Tons,** Elkhorn, Wis., Army Buildings to Ceco Steel Products Co., Chicago.

100 **Tons,** Grand Forks, N. D., gymn and field house to Husted Co.

100 **Tons,** Minneapolis, Minneapolis and St. Louis Railroad Building to Cowin Co.

100 **Tons,** Maysville, Ky., flood protection to Truscon Steel Co.

Reinforcing bar inquiries this week included the following:

1938 **Tons,** Goleta, Calif., Cachuma Dam construction, Bureau of Reclamation, Goleta, Spec. 3084, bids to July 6.

1620 **Tons,** Wilmington, Del., approaches to Delaware Memorial Bridge, due June 15.

1050 **Tons,** Loveland, Colo., Carter Lake Pressure Tunnel, Bureau of Reclamation, Denver, Spec. 3081, bids to June 27.

900 **Tons,** Burlington - Mercer Counties, N. J., New Jersey Turnpike Authority, Section 3(37), due June 29.

415 **Tons,** Chicago, Auxiliary Outlet sewers contract No. 2.

416 **Tons,** Madison, Wis., Hospital and Nurses Home.

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Weldit Weldimatics will reduce your welding costs more than 30% by saving fuel and labor time. Use Weldimatics and increase your profits. Write today for complete information.

Weldimatic Welding Torch "W-46", with built-in automatic Gasaver. Time study in auto plants showed an average gas savings per man of $4.80 per day with this Weldit Torch. Weighs only 13 ounces. No operator's fatigue.

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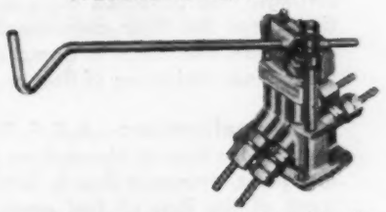

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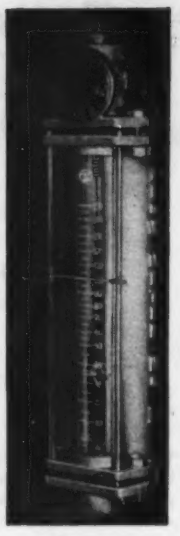

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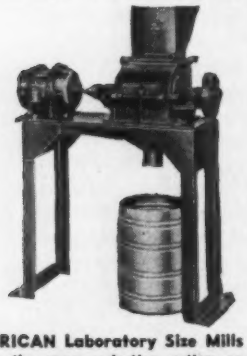
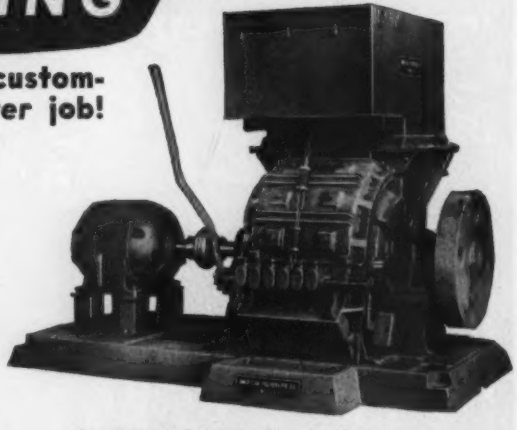


AMERICAN Laboratory Size Mills
With the same reduction action as Metal Turnings Crushers (or hammer action)—American Laboratory Size Mills offer an efficient means for reducing razor blades, pewter castings and fragile, thin brittle steel to a reclaim product.



AMERICAN Metal Turnings Crushers
Bulky, hard-to-handle turnings are rapidly reduced as much as 80% with this efficient, economical crusher. And the yield of cutting oil is increased 30 to 50 gallons per ton—proof of how profitable the installation of an American Metal Turnings Crusher can be for those who handle 20 tons or more of metal turnings a month.

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Dates to Remember

June 19-23—American Society of Mechanical Engineers, semiannual meeting, Hotel Statler, St. Louis. Society headquarters are at 29 W. 39th St., New York.

June 22-23—Malleable Founders' Society, annual meeting, The Homestead, Hot Springs, Va. Society headquarters are in the Union Commerce Bldg., Cleveland.

June 26-30—American Society for Testing Materials, annual meeting and exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters are at 1916 Race St., Philadelphia.

June 29-July 1—National Industrial Advertisers Assn., annual conference, Biltmore Hotel, Los Angeles. Association headquarters are at 1776 Broadway, New York.

Sept. 5-9—National Chemical Exposition, Chicago Coliseum, Chicago. American Chemical Society, Chicago Section headquarters are at 86 E. Randolph St., Chicago.

Sept. 12-14—Society of Automotive Engineers, tractor meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

Sept. 13-15—National Petroleum Assn., annual meeting, Hotel Traymore, Atlantic City, N. J., Association, headquarters are in the Munsey Bldg., Washington.

Sept. 18-22—Instrument Society of America, conference and exhibit, Memorial Auditorium, Buffalo. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 19-21—American Society of Mechanical Engineers, fall meeting, Hotel Sheraton, Worcester. Society headquarters are at 29 W. 39th St., New York.

Sept. 23-26—Packaging Machinery Manufacturers Institute, annual meeting, Homestead, Hot Springs, Va. Institute headquarters are at 342 Madison Ave., New York.

Sept. 26-29—Assn. of Iron & Steel Engineers, exposition and annual convention, Public Auditorum, Cleveland. Association headquarters are in the Empire Bldg., Pittsburgh.

Sept. 27-30—Society of Automotive Engineers, aeronautic meeting and engineering display, Biltmore Hotel, Los Angeles. Society headquarters are at 29 W. 39th St., New York.

Oct. 6-8—National Assn. of Waste Material Dealers, fall meeting, Hotel Traymore, Atlantic City, N. J. Association headquarters are in the Times Bldg., New York.

Oct. 10-12—Society of Industrial Packaging & Materials Handling Engineers, exposition, Convention Hall, Philadelphia. Society headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 12-13—Gray Iron Founders' Society, annual meeting, Netherlands Plaza Hotel, Cincinnati. Society headquarters are at 210 National City-E. 6th Bldg., Cleveland.

Oct. 23-27—National Metal Congress & Exposition, International Amphitheater, Chicago. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

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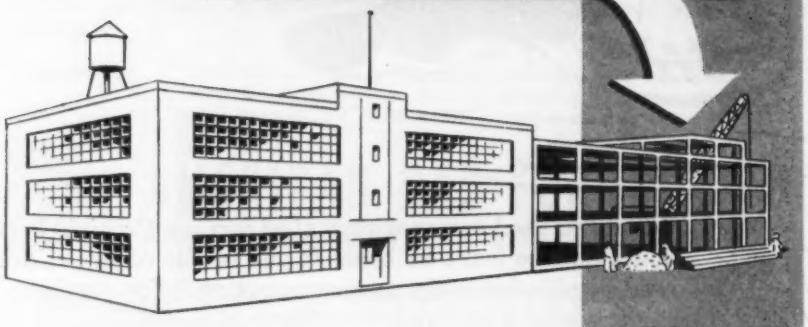

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FREE

PUBLICATIONS

Continued from Page 40

factory or economical for all applications. *Alloy Rods Co.*

For free copy check No. 9 on postcard, p. 41.

Foundry Shakeout

The new line of Link-Belt heavy duty "CA" foundry shakeouts is shown in an illustrated 4-p. folder. Models described range in load capacity from 8000 to 30,000 lb, claiming faster, better, cleaner separation of sand and castings from flasks and molds. *Link-Belt Co.*

For free copy check No. 10 on postcard, p. 41.

Gear Information

Bulletin DRA presents full information on Duti-Rated gears with selection, dimensions and rating tables, and is available to any manufacturer interested in incorporating gears in his product. *Foote Bros. Gear & Machine Corp.*

For free copy check No. 11 on postcard, p. 41.

Trolley Conveyers

Specifications of standard stock units of Universal trolley cable conveyers are given in a new bulletin. Automatic loading and unloading are shown, along with action photos illustrating applications in industry. Condensed data on trolleys, track, idler turns, vertical "S" curves, drives and quick vertical dips are also shown. *E. W. Buschman Co.*

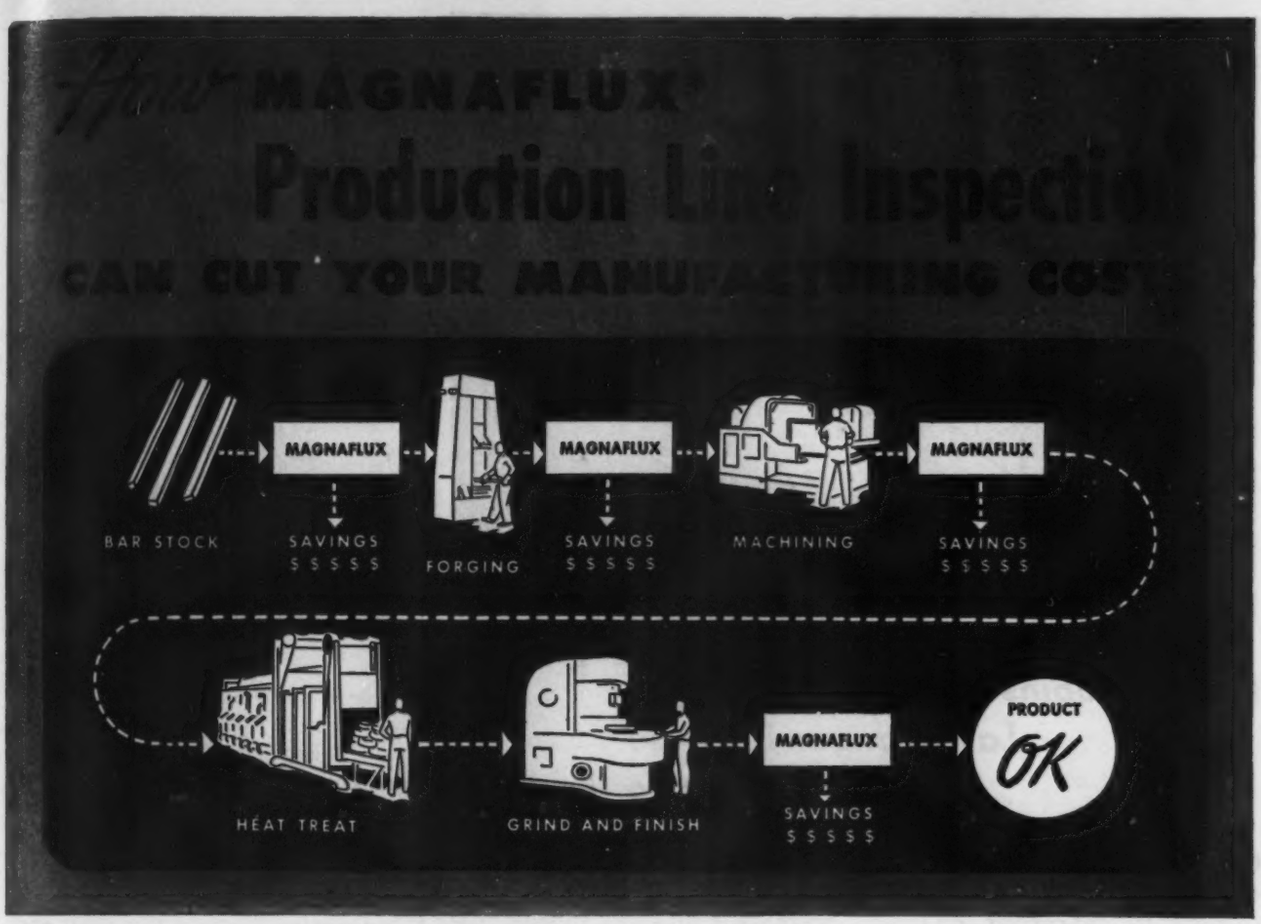
For free copy check No. 12 on postcard, p. 41.

Steam Cleaner Data

Users of steam cleaners will be interested in a new 9-p. booklet on the operation and maintenance of such equipment. The booklet contains general information on the steam cleaner and a simple schematic diagram to show how it operates. A principal feature is a list of possible sources of coil scale build-up, enabling users to circumvent these troubles. Do's and Dont's for greatest efficiency and economy are also listed. *DuBois Co.*

For free copy check No. 13 on postcard, p. 41.

Resume Your Reading on Page 41



Defective parts are rejected *before* additional money is spent in finishing them with inspection by Magnaflux on the production line and trouble is found and corrected when it occurs—not later. For many plants this method of inspection is already saving thousands of dollars in manufacturing costs each year.

For example, by inspection with Magnaflux a gear manufacturer is able to reject defective pieces of material in bar form, or after forging. He saves the cost of machining, heat treating, grinding and finishing many pieces which would later be rejected at final inspection. In rejecting still more pieces after machining, with a third Magnaflux inspection, he saves the cost of heat treating and grinding.

Add up the total savings made by cutting out subsequent steps for all rejects. You'll see that *total* cost of inspection is *much less* than cost of carrying all defective parts to finish stage. Here is a table showing these savings:

Table Based on Processing 1000 Parts	Processing Cost Investment	Rejects Due to Operation	Savings in Cost to Finish	Inspection Costs all Parts
Bar	$ 1.00	10	$190.00	$ 70.00
Forging	3.00	10	170.00	69.30
Machined Gear	11.00	10	90.00	68.60
Ground and Finished Gear	20.00	20		67.20
		50	$450.00	$275.10

Inspection with Magnaflux not only pays for itself, but gives a net savings of $174.90 per 1,000 gears. This example is based on 100% inspection after each operation except heat treating. However, sampling methods often can be used for similar in-process inspection to cut manufacturing costs.

Magnaflux, and other Magnaflux Corporation non-destructive testing methods, make cracks and other defects readily visible for inspection of every part at production line speed. Write today for full information on how Magnaflux can help you raise product quality and cut production costs.

*Magnaflux, Reg. U. S. Pat. Off., a trade mark of Magnaflux Corporation applied to its equipment and materials for magnetic particle inspection.

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And what's "best" for one materials handling job isn't always best for another. That's why we make three types of belting: Maltese Cross® for the hardest, toughest jobs; Ajax® for general service, and Conservo® for lighter applications and portable conveyors.

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There's a Hewitt-Robins conveyor belt for every bulk materials handling assignment, below and above ground. For the best buys in belting, call your Hewitt Rubber distributor (listed under "Rubber Products" in the classified 'phone book) or, write Hewitt Rubber Division, 240 Kensington Avenue, Buffalo 5, N. Y.

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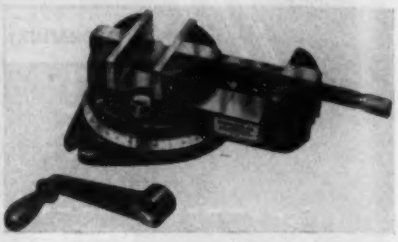
PRODUCTION IDEAS

Continued from Page 44

90° then back to 0°, allowing synchronized readings from markers on either side of the vise. Hardened and ground steel removable

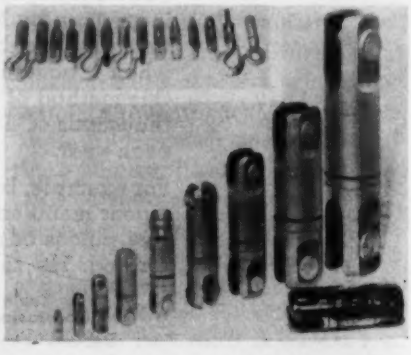


jaws are 1¼ in. deep x 3⅝ in. wide x 5/16 in. thick. The vise opens to a full 4 in. and may be used independently of the base. It weighs 16 lb. *Kenco Mfg. Co.*

For more data check No. 30 on postcard, p. 41.

Ball Bearing Swivels

A complete line of Miller swivels for eliminating wire line twist and kinking consists of 15 different types of end connections and nine



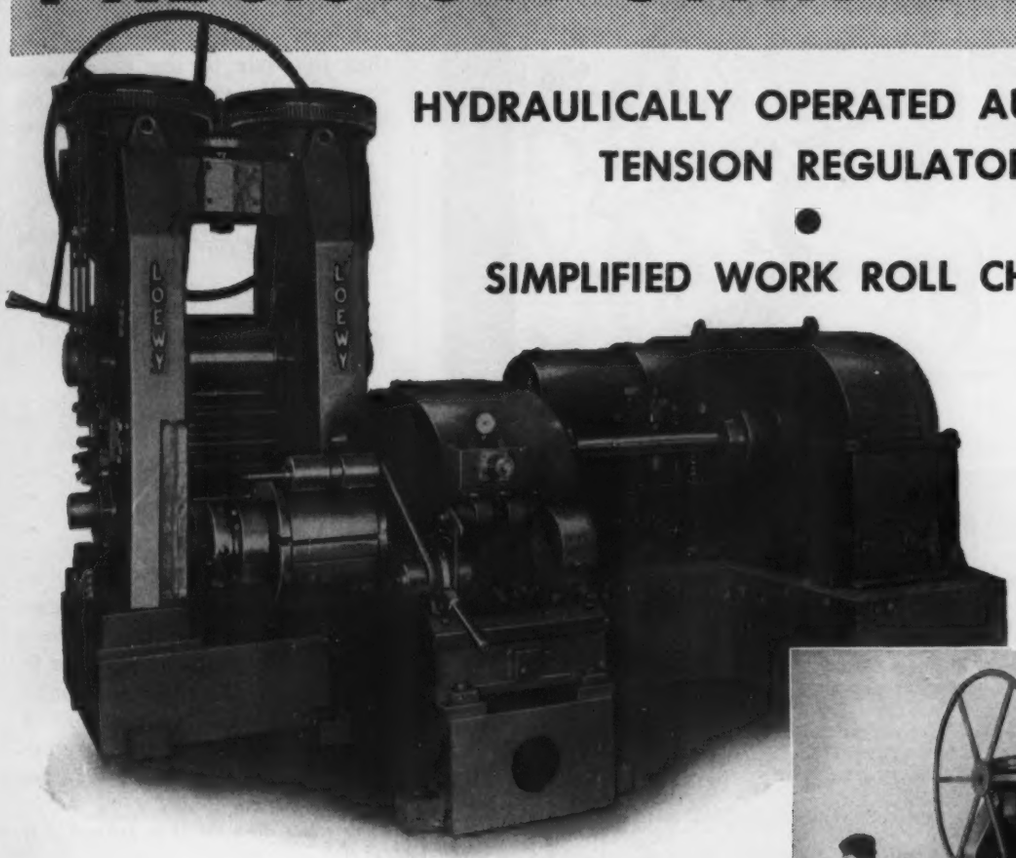
swivel capacities ranging from 250 to 46,200 lb working load. All Miller swivels have a safety factor of 5 to 1. They turn freely under maximum stress. *General Machine & Welding Works.*

For more data check No. 31 on postcard, p. 41.

Dial Groove Gage

For quality control inspection during production, the new self-positioning Nilco dial groove gage measures internal groove diameters and recesses used for retaining rings, O rings, oil grooves, ball races, etc. The nose of the gage

MODERN 4-HIGH PRECISION STRIP MILLS



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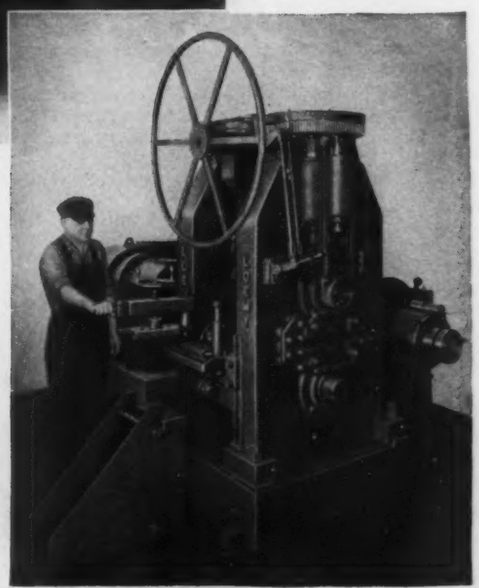

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extension with a fixed gaging insert is pulled in by the trigger when inserting the nose into a housing. Releasing the trigger locates the groove almost instantly. A dial indicator in 0.0001, 0.00025, or 0.0005 mm calibrations gives quick, accurate reading. *Nilsson Gage Co., Inc.*

For more data check No. 32 on postcard, p. 41.

Vibration Isolator

A new low-cost vibration isolator for mounting pumps, compressors, fans, engine-generator sets, and

other equipment where economical and rugged isolation is required, is intended for marine, mobile or stationary installations. The steel springs are guaranteed for the life of the equipment and are said to

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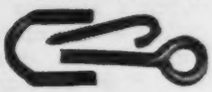

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WEATHER-TIGHT BOLTS: Eliminate counter-boring in wood assemblies.

PIPE PLUGS: Forged Steel, heat-treated.

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NO MATTER WHAT soft metals you heat: lead, pewter, tin or salt—for coating, annealing, tempering or a special application—your plant needs Kemp Immersion Heating! Take *heat recovery* as an index of Kemp's amazing performance. A full *12 ton* Kemp pot, out of service for *two days*, can be brought to 600° F. in *less than two hours!*

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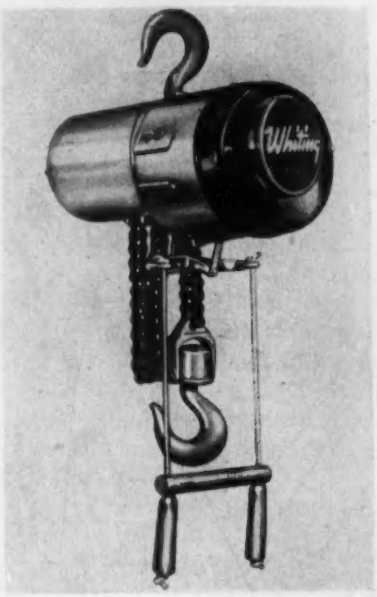
Address .....
City .....Zone .....State .....

provide a high isolation efficiency. Housings are malleable castings, sealed by a cylindrical cork ring, which snubs horizontal thrust and prevents all metal-to-metal contact. *Korfund Co.*

For more data check No. 33 on postcard, p. 41.

Electric Chain Hoists

A line of improved electric roller-chain hoists retain the simple, totally enclosed, double worm-gear drive of previous models. Improved braking power and longer brake life are provided



by a spring-set, shoe-type motor brake, in which the lining is bonded to the shoe. The pull cord has been relocated at the center of the hoist frame to eliminate possible tipping when the cord is pulled. Switch wiring and motor are accessible for inspection and repair. Hoists are available in ¼, ½, 1 and 2-ton capacities. *Whiting Corp.*

For more data check No. 34 on postcard, p. 41.

Automatic Metal Sorter

High speed, non-destructive quality control and sorting of metal parts of any size can be accomplished with a new automatic Cyclograph. Based on Dumont patents and operating on magnetic principles, it can rapidly sort by analysis of the part, structure, hardness, case depth, brittleness,

Mono-Cushion

Tough all the way through

This baby is all muscle—resilient, highly wear-resistant rubber right down to the rim. Mono-Cushions are built with plenty of beef, designed with just one thing in mind: To knock a big chunk off your tire costs.

Cushion all the way through

No cushion tire does a better job of soaking up bumps and jolts than Mono-Cushion. Rubber especially compounded for resilience plus contour designed for maximum shock absorption does the trick.

THE NEW MONARCH INDUSTRIAL CUSHION TIRE

Adds up...

. . . to an easy ride for drivers, less breakage in loads, less vehicle maintenance, lower tire costs.

The leading manufacturers of industrial trucks use Mono-Cushions as original equipment. Replacements available from the manufacturer of your equipment or his service branches.

THE MONARCH RUBBER COMPANY

301 LINCOLN PARK • HARTVILLE, OHIO

SPECIALISTS IN INDUSTRIAL SOLID TIRES

GALVANIZING by induction *

Seven ton capacity Ajax Low Frequency Induction Furnace now in use for Hot Dip Galvanizing.

another AJAX First

Showing the heavy refractory brick lining walls containing the molten zinc. No iron kettle is used.

Now Ajax engineers have developed a galvanizing furnace lined with an inert refractory material. The melt is internally heated by the electric induction principle introduced by Ajax more than thirty years ago. Costly iron kettle replacements and dross formation from iron kettle are eliminated. Internal circulation assures complete uniformity of temperature.

FASTER PRODUCTION • UNIFORM QUALITY
LESS MAINTENANCE • LOW OPERATING COST
ABSOLUTE TEMPERATURE CONTROL • LONG LIFE • REDUCED DROSSING • NO HOT SPOTS
SMALLER ZINC BATH POSSIBLE

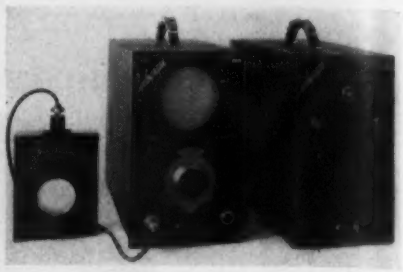
AJAX ENGINEERING CORPORATION
TRENTON 7, N. J.

AJAX TAMA-WYATT

INDUCTION MELTING FURNACE

Associate Companies: AJAX METAL COMPANY, Non-Ferrous Ingot Metals and Alloys for Foundry Use. AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces. AJAX ELECTRIC CO., INC., The Ajax-Hultgren Electric Salt Bath Furnace. AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting.

or any metallurgical difference. Testing speeds of 1 to 5 per sec can be attained when parts are sent through the test coil on belt conveyer or by other fast feeding

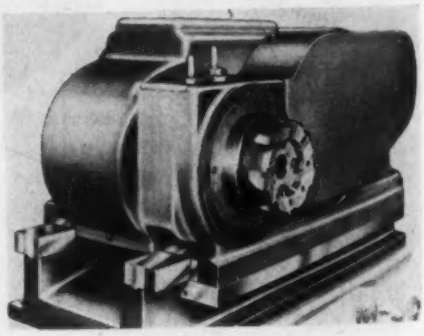


means. The Cyclograph provides both single level and two level sorting. The instrument can be used to reject parts giving a low Cyclograph reading or to reject both above and below an established acceptable range. *J. W. Dice Co.*

For more data check No. 35 on postcard, p. 41.

Milling Head

A new milling head for production milling has all gears integral or mounted solidly by taper and key to lock them in place on the shafts. Adjustment of the steel quill up to 2 in. for cutter wear is obtained by an Acme thread, and the move-



ment gaged by a micrometer dial. The head is arranged with a single speed for production work using high speed steel or tungsten carbide-tipped cutters; change gears can be provided. Lubrication inside the head to bearings and gears is positive by a geared pump; automatic lubrication is provided for the hardened steel ways. *Motch & Merryweather Machinery Co.*

For more data check No. 36 on postcard, p. 41.

Resume Your Reading on Page 45

Briefs and Bulletins

chain reaction—In the wake of upward adjustments made earlier in Chicago and other cities, U. S. Steel Supply Co., Jones & Laughlin, and Ryerson warehouses announced price rises of from $2 to $4 per ton at Pittsburgh. Hot rolled carbon bars were up 10c per 100 lb to $5.10; hot rolled sheets 18 gage and heavier, up 10c to $5.15; cold rolled sheets up 15c to $5.95; galvanized sheets, 10 gage, up 10c to $6.60; plates, up 20c to $5.35; floor plates up 20c, ⅛-in. and heavier to $6.60 and 12 gage and lighter to $7.15; shapes up 20c to $5.25. U. S. Steel increases were effective June 5, J. & L., June 9, and Ryerson, June 6.

no slump seen—Steel producers in Alabama do not anticipate a slackening of production in the summer and fall. A heavy backlog of orders ensures full production for at least 3 months at all mills. Plate is in high demand and no more orders are being booked. Despite the increase of scrap prices, mills in Alabama do not foresee a rise in steel at present. They say that if it proves necessary to move up the price scale at a later date it will be all along the line. Pig iron prices are steady and producers have a good supply.

rally from low—May domestic freight car deliveries rallied from their postwar low in April, reveals the American Railway Car Institute. They were 2193 as compared with 971 in April and 9525 in May, 1949. New May orders, including Pennsylvania Railroad's 10,000 car order, were 11,636, of which 11,414 went to carbuilders and the rest to railroad shops. Order backlog as of June 1, was 25,393 for the carbuilders; 16,908, railroad shops. May deliveries included 1211 from carbuilders and 982 from road shops.

warehouse prices—Increased West Coast demand for plates, structurals, and other items has brought about warehouse price rises of 20c in plates, 40c in structural shapes, and 5c to 75c per cwt in other items. Late last week San Francisco warehouses had instituted comparable increases for alloy bars and galvanized sheets. Other item prices remained static although increases were expected momentarily.

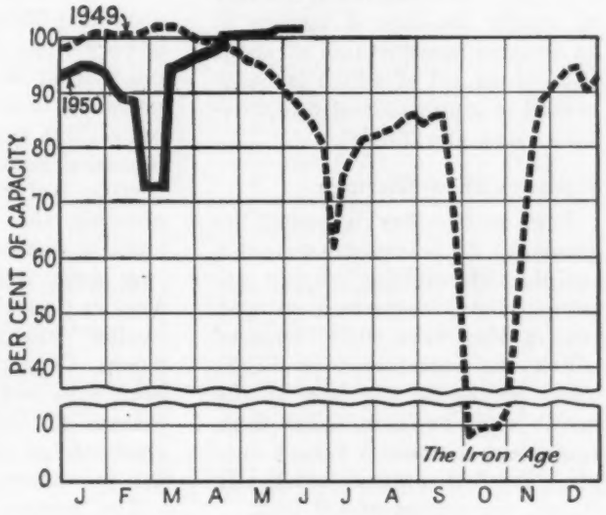
galvanized—With zinc now selling for 15c per lb, galvanized sheets have increased $2.40 per ton since June 3. The increase is automatic with each increase to the half cent in the price of zinc. Decreases are made when zinc declines.

the invader—Another loss of reinforcing bar tonnage to foreign steel since the end of World War II took place in the Philadelphia district recently. The sewage treatment plant for Norristown, Pa., will be made with reinforcing steel from Luxembourg. General contractor of the job, Robert E. Lamb & Son, Inc., Philadelphia, will buy in stock lengths, cutting and fabricating on the job.

operations—Although steelmaking operations are still clinging tenaciously above the century mark (unchanged at 101.5 pct of rated capacity this week), operating men don't believe they can keep it up much longer. Hot weather and vacations will take their toll. But this will be one of the highest operations for summertime that the industry has seen for a long time.

take a fall—Shipments of aluminum sheet, strip and plate in April dropped to 45,408 net tons from the 55,779 ton record in March, the Aluminum Assn. reports. Production of primary aluminum was 58,024 tons in April, compared with 58,747 tons in March, a longer month.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
June 4	103.0*	103.7	94.0	88.0	98.0	104.0	108.0	102.0	108.0*	102.0	92.0	91.0	100.0	101.5
June 11	102.5	104.0	94.0	88.0	99.0	104.0	108.0	104.0	107.0	102.7	92.0	91.0	100.0	101.5

* Revised.

Nonferrous Metals OUTLOOK

Market Activities

by JOHN ANTHONY

Zinc price reaches 15¢ . . . Market conditions point to further price movement . . . Copper is scarce at 22¢ . . . Higher prices reported paid . . . Stockpile talks held.

New York—The Joplin ore price moved up again last week, to $95 a ton for zinc concentrates. This caused producers to advance the price of Prime Western zinc another ½¢ per lb on June 12. A strike has developed at the Rosita smelter in Mexico, taking an estimated 4500 tons of Prime Western monthly out of the market. Foreign slab zinc has been coming in during the first 4 months at an average monthly rate of about 12,500 tons, all of which is badly needed to supply domestic requirements and stockpiling.

Statistics Show Shortage

Even so, the May figures of the American Zinc Institute reveal a rapidly deteriorating supply position. Total shipments of slab zinc in May were 90,346 tons, of which the stockpile took 17,331 tons. Stocks at the end of the month were down to 41,819 tons, equivalent to about a 2-week supply. Unfilled orders, constantly rising, are now at 66,430 tons.

The Zinc Advisory Committee is meeting this week with the Munitions Board on stockpiling. The feeling is general in the trade that stockpiling at a time when the buying pressure is so heavy will have a very bad effect on the economy of the industry by causing inflationary pressure.

Chile Copper Strike

The price of copper has not gone above the 22½¢ level. But there is very little copper available to the market at that price. Scrap is coming in to refiners at the new prices, but the volume could not be called heavy. Dealers are expecting a further rise in price, and all the market conditions point to such a development.

A new strike developed last week at Chuquicamata, Chile, producing about 15,000 tons a month. Copper is reported to have been sold last week in some instances at 23¢ to 23¼¢ where emergencies required above market purchases.

The copper industry advisory committee met with the munitions board last week to talk over the stockpiling program. Industry members learned the government buying of copper would be pressed regardless of its effects on the market.

The lead market has been fairly active. But imports continue to threaten the stability of the market. April imports of metal were about 32,500 tons, only a few thousand tons lower than average domestic mine production. In contrast to the government's policy for stockpiling of copper and zinc, no lead stockpiling is planned for the next fiscal year. This matter is expected to be brought up for discussion with the Munitions Board.

Copper Scrap Up

Refiners moved up their buying prices for copper scrap by ¼¢ early this week, making the price of No. 1 heavy copper 19¼¢. This is still not a high enough price to force an immediate rise in the primary copper market. But all other factors place the market in a very strong position.

The tin market was down slightly during the week based on Singapore market transactions. The volume of business in the domestic market is still rather light.

NONFERROUS METALS PRICES

	June 7	June 8	June 9	June 10	June 12	June 13
Copper, electro, Conn.	22.50	22.50	22.50	22.50	22.50	22.50
Copper, Lake, Conn.	22.625	22.625	22.625	22.625	22.625	22.625
Tin, Straits, New York ...	78.375	78.375	78.25	....	77.75	*77.50
Zinc, East St. Louis	14.50	14.50	14.50	14.50	15.00	15.00
Lead, St. Louis	11.80	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.
*Tentative.

MILL PRODUCTS

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 27.4¢; 4S, 61S-O, 29.3¢; 52S, 31.4¢; 24S-O, 24S-OAL, 30.3¢; 75S-O, 75S-OAL, 36.8¢; 0.081 in., 2S, 3S, 28.4¢; 4S, 61S-O, 30.7¢; 52S, 32.8¢; 24S-O, 24S-OAL, 31.4¢; 75S-O, 75S-OAL, 38.5¢; 0.032 in., 2S, 3S, 30.0¢; 4S, 61S-O, 34.0¢; 52S 36.7¢ 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 48.1¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 24.8¢ 4S-F, 27¢; 52S-F, 28.1¢; 61S-O, 27.6¢; 24S-F, 24S-FAL, 28.1¢; 75S-F, 75S-FAL, 34.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 67¢; 11 to 13, 34.3¢ to 79¢; 23 to 25, 36.3¢ to $1.08; 35 to 37, 43.3¢ to $1.66.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34.5¢ to 31¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 37¢ to 32.5¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4, ⅛ to 11/32 in., 49.5¢ to 38.5¢; ⅜ to 1½ in., 33¢ to 36¢; 1 9/16 to 3 in., 36¢ to 33¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36.5¢ to 27¢; 52S, 44.5¢ to 32.5¢; 56S, 47.5¢ to 39¢; 17S-T4, 50.5¢ to 35¢; 61S-T4, 45¢ to 34.5¢; 75S-T-6, 76.5¢ to 55.5¢.

Extruded Tubing, Rounds: 63S-T5; OD in in.: 1¼ to 2, 33.5¢ to 49¢; 2 to 4, 30.5¢ to 41.3¢; 4 to 6, 31¢ to 37.8¢; 6 to 9, 31.5¢ to 39.3¢.

Roofing Sheet, Flat: 0.019 in. x 28 in, per sheet, 72 in., $1.008; 96 in., $1.344; 120 in., $1.679; 144 in., $2.017. Gage 0.024 in. x 28 in., 72 in., $1.224; 96 in., $1.633; 120 in., $2.042; 144 in., $2.451. **Coiled Sheet:** 0.019 in. x 28 in., 24.7¢ per lb; 0.024 in. x 28 in., 23.7¢ per lb.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ⅛ to 0.311, 58¢; ½ to ⅝, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher. Base: Up to ⅝ in. diam., 10,000 lb; ⅝ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ⅜ to 7/16, 55¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ⅞ to 1, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	69	53
Strip, cold-rolled	75	56
Rods and bars	65	51
Angles, hot-rolled	65	51
Plates	67	52
Seamless tubes	98	86
Shot and blocks	..	46

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	35.43	....	35.03
Copper, h-r	....	31.28	....
Copper, drawn	....	32.53	....
Low brass	33.42	33.11	....
Yellow brass	32.03	31.72	....
Red brass	33.89	33.58	....
Naval brass	36.71	30.77	32.03
Leaded brass	....	26.43	30.49
Com'l bronze	34.88	34.57	....
Manganese bronze	40.21	34.10	35.66
Phosphor bronze	53.17	53.42	....
Muntz metal	34.93	30.49	31.74
Everdur, Herculoy, Olympic, etc.	40.14	39.08	....
Nickel silver 10 pct	42.77	46.63	49.71
Arch. bronze	....	....	30.49

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	17.50
Aluminum pig	16.50
Antimony, American, Laredo, Tex.	24.50
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$56.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	22.50
Copper, Lake, Conn. Valley	22.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $110
Lead, St. Louis	11.80
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb	21.50
Magnesium, sticks, 100 to 500 lb	37.50¢ to 39.50¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $71
Nickel, electro, f.o.b. New York	51.22
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	44.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	72.75
Tin, New York	77.50
Zinc, East St. Louis	15.00
Zinc, New York	15.72
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	21.75-22.00
No. 120	21.25-21.50
No. 123	20.75-21.00
80-10-10 ingot	
No. 305	25.50
No. 315	23.50
88-10-2 ingot	
No. 210	31.50
No. 215	29.00
No. 245	23.75-24.75
Yellow ingot	
No. 405	18.25-19.00
Manganese bronze	
No. 421	23.50

Aluminum Ingot

(Cents per lb, of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.00-20.25
0.60 copper, max.	19.75-20.25
Piston alloys (No. 122 type)	18.50-19.00
No. 12 alum. (No. 2 grade)	17.75-18.25
108 alloy	18.50-19.00
195 alloy	19.50-20.00
13 alloy	20.00-20.25
AXS-679	18.50-19.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	19.25-19.50
Grade 2—92-95%	18.25-18.50
Grade 3—90-92%	17.25-17.50
Grade 4—85-90%	16.75-17.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39⅛
Electrodeposited	33⅜
Rolled, oval, straight, delivered	36.59
Forged ball anodes	41
Brass, 80-20	
Cast, oval, 15 in. or longer	32¾
Zinc, oval	22½
Ball anodes	21½
Nickel 99 pct plus	
Cast	68.00
Rolled, depolarized	69.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	49¼
Copper sulfate, 99.5 crystals, bbl.	10¾
Nickel salts, single or double, 4-100 lb bags, frt allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, 89 pct granular	7.15
Zinc cyanide, 100 lb drums	43¼

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	17½	16¾
Yellow brass	14⅝	13⅜
Red brass	16	15¼
Commercial bronze	16⅜	15⅝
Manganese bronze	13⅞	13
Leaded brass rod ends	14⅝	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	18.25
Light copper	17.25
Refinery brass	17.50*
Radiators	13.25

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	19.25
No. 2 copper wire	18.25
Light copper	17.25
No. 1 composition	16.50
No. 1 comp turnings	16.00
Rolled brass	13.50
Brass pipe	15.00
Radiators	13.50
Heavy yellow brass	12.50
Aluminum	
Mixed old cast	10.00-10.25
Mixed old clips	10.75-11.00
Mixed turnings, dry	10.00-10.25
Pots and pans	10.00-10.25
Low copper	11.75-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	17 —17¼
No. 2 heavy copper and wire	16 —16¼
Light copper	15 —15¼
Auto radiators (unsweated)	11¼—11½
No. 1 composition	14½—14¾
No. 1 composition turnings	14 —14¼
Clean red car boxes	12¾—13
Cocks and faucets	12¾—13
Mixed heavy yellow brass	10 —10¼
Old rolled brass	11 —11¼
Brass pipe	13 —13¼
New soft brass clippings	14¾—15
Brass rod ends	12¾—13
No. 1 brass rod turnings	12½—12¾

Aluminum

Alum. pistons and struts	6 — 6½
Aluminum crankcases	8½— 9
2S aluminum clippings	11½—12
Old sheet and utensils	8½— 9
Borings and turnings	5½
Misc. cast aluminum	8½— 9
Dural clips (24S)	8½— 9

Zinc

New zinc clippings	10 —10¼
Old zinc	7¾— 8
Zinc routings	5¼— 5½
Old die cast scrap	5½— 5¾

Nickel and Monel

Pure nickel clippings	36 —39
Clean nickel turnings	32 —35
Nickel anodes	36 —39
Nickel rod ends	36 —39
New Monel clippings	15 —19
Clean Monel turnings	10 —14
Old sheet Monel	14 —18
Inconel clippings	20 —24
Nickel silver clippings, mixed	9 —10
Nickel silver turnings, mixed	6 — 7

Lead

Soft scrap, lead	9¾—10
Battery plates (dry)	5 — 5¼

Magnesium

Segregated solids	9 —10
Castings	5½— 6½

Miscellaneous

Block tin	62 —64
No. 1 pewter	41 —43
No. 1 auto babbitt	37 —39
Mixed common babbitt	9¾—10
Solder joints	12½—13
Siphon tops	37 —39
Small foundry type	13 —13½
Monotype	11½—12
Lino. and stereotype	11 —11½
Electrotype	9¾—10
New type shell cuttings	15 —15¼
Hand picked type shells	6½— 7
Lino. and stereo. dross	4¼— 4¾
Electro. dross	2¾— 3

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Buyers Seek Price Cut in Waiting Game

Following the record-shattering increases of the past month, the scrap market has now snagged and No. 1 steel dropped from 50¢ to $3.00 a ton in most areas. With continued high level steelmaking operations maintaining demand, scrap buyers were just sitting back waiting for prices to readjust themselves.

Main complaint was that prices had zoomed too sharply and almost no buying was going on in major centers early this week. All factors considered, what the next step will be seems to be a question for the prophets.

The outlying West Coast and Canadian markets finally felt the terrific pressure which drove prices skyward elsewhere with the result that their long stagnant prices went up $2.00 and $3.00 respectively.

PITTSBURGH—The market appeared to be entering a period of readjustment with a softer tone. Some brokers said they were able to buy in a range of $42.00 to $43.00. Others were not so bearish. In view of the uncertainty, the price here was off $2.00 from last week's all-time high, to a range of $44.50 to $45.00 for No. 1 heavy melting. One fact that cannot be overlooked is that the industry's operating rate continues at a high level and is likely to remain there for some time. The railroad list was generally stronger.

CHICAGO—A considerable tonnage of No. 1 heavy melting steel was bought by a local mill last week for $40.00 per gross ton. No. 2 heavy melting was bought for $38.00 gross, No. 1 factory bundles for $40.00 and No. 2 dealers' bundles for $36.00. Many feel that the peak of the market has been reached. Dealers who had been holding their scrap are shipping heavily on these orders.

PHILADELPHIA—The weakness in the Pittsburgh market that developed last week has acted as a restraining influence on the local market. During the week prices of steel grades had surged above quotations of last week. But an appraisal of the market early this week indicated reductions of $2.00 from previous quotations. New mill business had not been placed, but all factors are busy gaging the strength of the market.

NEW YORK—No one was buying here early this week except for a few isolated cases where it was known that the scrap was actually in the yards. Most yards were cleaned out at the higher prices; brokers found themselves in a long position and were waiting to see what the mills would do next. Prices generally ranged downward, except in cast grades.

DETROIT—The cork has been pulled on Detroit scrap after a long upward spiral. Prices this week are off as much as $4.00 per ton. Sharpest declines have come, as expected, in premium grades like bundles, low phos plate and new busheling. Other prices have been pulled down and even cast material is sympathetically affected. There is no buying here. Present indications are that a decline in the market has only begun unless stabilizing influences are unexpectedly found.

CLEVELAND—Signs that the scrap market has either topped off or reached the correction point were in evidence here and in the Valley this week. No. 1 heavy melting steel was offered at least one major consumer in the Valley at $44.50, off $1.00. Premium prices and the fact that the market was near the peak brought out a flood of tonnage, which is being thrown at brokers. On the other hand, a major break in prices will dry the market up. This week's market is confused, but still in firm hands.

ST. LOUIS—A combination of short covering, outside buying, and purchases by local consumers caused further increases in scrap prices here. Earlier advances in other markets also had a strengthening effect here. Gray iron foundries are buying more actively. Movement has improved with the higher prices.

CINCINNATI—With mills playing a waiting game, the scrap market here softened up this week. Based on broker offers, prices are off and mills can buy at $2.00 under last week's high. The market is definitely confused despite its underlying strength. Brokers are guessing that it will level off somewhat below the present prices. Foundry demand has picked up and cast grades are moving freely. Turnings are still soft and in easy supply.

BOSTON—The spiraling market, which carried the price of No. 1 heavy melting steel up $9.00 in the last month, definitely struck a snag here this week. No. 1 dropped $3.50 and no business is going on. Everyone feels that the price zoom was too rapid and is now sitting back waiting for the market to stabilize.

BIRMINGHAM—The hectic buying spree seems to have ended and prices are mostly steady this week, with dealers saying that declines may be expected unless buying is resumed. Local mills have placed orders for monthly requirements and scrap is beginning to move into the mills at a fair rate. Present prices are causing holders to offer scrap for sale.

BUFFALO—Weaker tendencies dominate the market with prices unchanged. All leading mill consumers are out of the market. Dealers reported supplies heavy and were refusing to accept material at prices in line with those on recent orders. The influx of water scrap continues with approximately 21,000 additional tons arriving during the week.

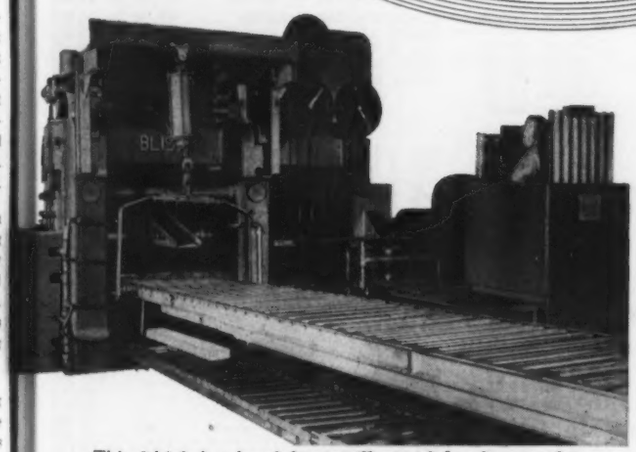
TORONTO—Canadian prices have been advanced at least $3.00 per gross ton all down the line, but despite this steel scrap here is still $10.00 to $12.00 per ton below U. S. prices resulting in comparatively little scrap import. While there has been some betterment in offerings there is not sufficient domestic scrap available to meet requirements.

Bliss Mills "ON REVIEW" at Stamford Rolling Mills Company.

Brass and copper breakdown is the job of this Bliss 4-high, 2-stand Tandem Strip Mill. Bliss coiler, at far left, coils flat bars. Tension reel winds lighter-gauge coils.

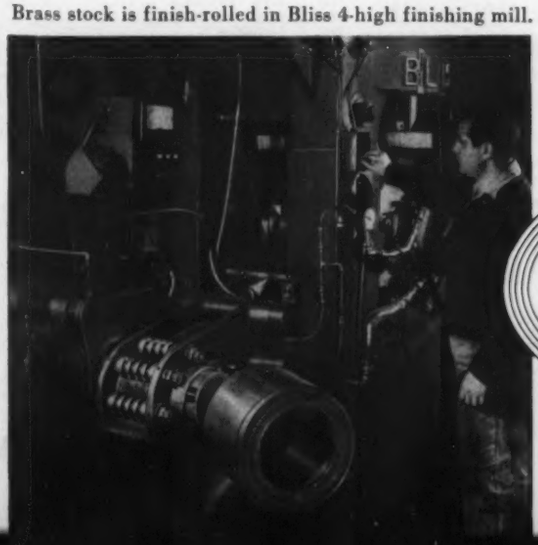
Heavy-gauge coils and flat bars are easily handled by this Bliss pinch roll feed. Entry side auxiliaries are designed to handle either coil or flat-bar stock.

All different rolling jobs..... All different Bliss Mills



This 3-high hot breakdown mill—used for three to five pass work—is being equipped with Bliss mill tables to facilitate and speed manipulating of brass bars.

Brass stock is finish-rolled in Bliss 4-high finishing mill.



You'd expect to see a variety of mills kept busy where so many different alloys and gauges of quality copper and brass are rolled in such large quantities as at the Springdale, Conn., plant of STAMFORD ROLLING MILLS COMPANY.

Here is a model of integrated production efficiency whose rolling mill equipment is predominantly BLISS—a 3-high hot breakdown mill, a 4-high, 2-stand tandem strip mill, a cluster mill for rundown, and another 4-high mill doing most of the finish rolling. In addition, the copper mill is being revamped for Bliss equipment.

Almost every mill is also equipped with Bliss accessories. The tandem mill, used for breakdown of both bar and coil stock, uses a Bliss pinch roll feed with a Bliss coil mandrel and elevator for quick, easy opening and handling of heavy-gauge coils. Flat bars are coiled on a Bliss coiler, and a Bliss tension reel, with belt wrapper, winds lighter gauges into compact, easy-to-handle coils. This complete Bliss mill unit has been operating at from 700 to 800 fpm for two years, working 16 hours a day, five days a week.

All the work-saving features of Bliss rolling mills and accessories can fit your production scheme, whether you do hot or cold rolling of ferrous or non-ferrous metals. Our engineers will be glad to discuss your problem with you.

E. W. Bliss Co.

General Office: Toledo 7, Ohio

Rolling Mill Division

Salem, Ohio

Rolling Mills, Mechanical and Hydraulic Presses, Container Machinery

Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$44.50 to $45.00
No. 2 hvy melting	35.50 to 36.00
No. 1 bundles	44.50 to 45.00
No. 2 bundles	34.50 to 35.00
Machine shop turn.	30.00 to 30.50
Mixed bor. and ms. turns.	30.00 to 30.50
Shoveling turnings	34.00 to 34.50
Cast iron borings	33.50 to 34.00
Low phos. plate	47.00 to 47.50
Heavy turnings	38.00 to 39.00
No. 1 RR. hvy. melting	46.50 to 47.00
Scrap rails, random lgth.	44.00 to 44.50
Rails 2 ft and under	47.50 to 48.50
RR. steel wheels	49.50 to 50.00
RR. spring steel	49.50 to 50.00
RR. couplers and knuckles	49.50 to 50.00
No. 1 machinery cast	43.50 to 44.00
Mixed yard cast.	37.50 to 38.00
Heavy breakable cast.	35.00 to 36.00
Malleable	44.00 to 45.00

Chicago

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 factory bundles	39.00 to 40.00
No. 1 dealers' bundles	39.00 to 40.00
No. 2 dealers' bundles	35.00 to 36.00
Machine shop turn.	25.50 to 26.50
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. forge crops	42.00 to 43.00
Low phos. plate	40.00 to 41.00
No. 1 RR. hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	46.00 to 47.00
Rerolling rails	52.50 to 53.50
Rails 2 ft and under	48.00 to 49.00
Locomotive tires, cut	44.00 to 45.00
Cut bolsters & side frames	40.00 to 41.00
Angles and splice bars	47.00 to 48.00
RR. steel car axles	57.00 to 58.00
RR. couplers and knuckles	45.50 to 46.50
No. 1 machinery cast.	48.00 to 49.00
No. 1 agricul. cast.	45.00 to 46.00
Heavy breakable cast.	38.00 to 39.00
RR. grate bars	37.00 to 38.00
Cast iron brake shoes	37.00 to 38.00
Cast iron car wheels	41.50 to 42.50
Malleable	47.00 to 48.00

Philadelphia

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	30.50 to 31.50
No. 1 bundles	34.00 to 35.00
No. 2 bundles	27.00 to 28.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	25.00 to 26.00
Low phos. punchings, plate	37.00 to 38.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. bundles	34.00 to 35.00
Hvy. axle forge turn.	34.00 to 35.00
Clean cast chem. borings	30.00 to 31.00
RR. steel wheels	39.00 to 40.00
RR. spring steel	39.00 to 40.00
Rails 18 in. and under	43.00 to 44.00
No. 1 machinery cast	39.00 to 40.00
Mixed yard cast	34.00 to 35.00
Heavy breakable cast	35.00 to 36.00
Cast iron carwheels	41.00 to 42.00
Malleable	44.00 to 45.00

Cleveland

No. 1 hvy. melting	$41.50 to $42.00
No. 2 hvy. melting	36.50 to 37.00
No. 1 busheling	41.50 to 42.00
No. 1 bundles	41.50 to 42.00
No. 2 bundles	31.50 to 32.00
Machine shop turn.	25.50 to 26.00
Mixed bor. and turn.	28.50 to 29.00
Shoveling turnings	28.50 to 29.00
Cast iron borings	28.50 to 29.00
Low phos. 2 ft and under	42.50 to 43.00
Steel axle turn.	39.50 to 40.00
Drop forge flashings	41.50 to 42.00
No. 1 RR. hvy. melting	48.00 to 48.50
Rails 3 ft and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
No. 1 machinery cast	48.00 to 49.00
RR. cast.	48.00 to 49.00
RR. grate bars	36.00 to 37.00
Stove plate	40.00 to 41.00
Malleable	46.00 to 47.00

Youngstown

No. 1 hvy. melting	$44.00 to $44.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	44.00 to 44.50
No. 2 bundles	33.50 to $34.00
Machine shop turn.	32.50 to 33.00
Shoveling turnings	34.50 to 35.00
Cast iron borings	34.50 to 35.00
Low phos. plate	45.00 to 45.50

Buffalo

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 busheling	38.00 to 39.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	32.00 to 33.00
Low phos. plate	44.00 to 45.00
Scrap rails, random lgth.	42.00 to 43.00
Rails 2 ft and under	48.00 to 50.00
RR. steel wheels	45.00 to 46.00
RR. spring steel	45.00 to 46.00
RR. couplers and knuckles	45.00 to 46.00
No. 1 machinery cast.	40.00 to 41.00
No. 1 cupola cast.	37.00 to 38.00
Stove plate	36.00 to 37.00
Small Indus. malleable	40.00 to 41.00

Birmingham

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	37.00 to 38.00
Structural and plate	36.00 to 37.00
Scrap rails, random lgth.	35.00 to 36.00
Rerolling rails	44.00 to 45.00
Rails 2 ft and under	42.50 to 43.50
Angles & splice bars	39.00 to 40.00
Std. steel axles	34.00 to 35.00
No. 1 cupola cast.	37.00 to 38.00
Stove plate	32.00 to 33.00
Cast iron carwheels	33.00 to 34.00

St. Louis

No. 1 hvy. melting	$38.00 to $40.00
No. 2 hvy. melting	33.00 to 34.00
No. 2 bundled sheets	33.00 to 34.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	27.00 to 29.00
Rails, random lengths	42.00 to 44.00
Rails 3 ft and under	47.00 to 49.00
Locomotive tires, uncut	42.00 to 43.00
Angles and splice bars	45.00 to 46.00
Std. steel car axles	52.00 to 53.00
RR. spring steel	45.00 to 46.00
No. 1 machinery cast.	40.00 to 42.00
Hvy. breakable cast.	37.00 to 39.00
Cast iron brake shoes	36.00 to 38.00
Stove plate	36.00 to 37.00
Cast iron car wheels	39.00 to 40.00
Malleable	44.00 to 45.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$32.00 to $34.00
No. 2 hvy. melting	27.00 to 28.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	19.00 to 19.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Clean cast chem. bor.	23.50 to 24.00
No. 1 machinery cast.	33.00 to 34.00
Mixed yard cast.	31.00 to 32.00
Charging box cast.	32.00 to 33.00
Heavy breakable cast.	32.00 to 33.00
Unstrp. motor blocks	22.50 to 23.50

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$29.00 to 31.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 bundles	29.00 to 31.00
No. 2 bundles	$25.00 to $26.00
Machine shop turn.	17.50 to 18.00
Mixed bor. and turn.	17.50 to 18.00
Shoveling turnings	19.00 to 20.00
No. 1 busheling	30.00 to 31.00
Clean cast chem. borings	20.00 to 20.50
No. 1 machinery cast.	31.00 to 32.00
No. 2 machinery cast.	27.00 to 27.50
Heavy breakable cast.	25.00 to 26.00
Stove plate	25.00 to 26.00

Detroit

Brokers' buying prices per gross ton, on cars.

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 bundles	39.00 to 40.00
New busheling	37.00 to 38.00
Flashings	34.00 to 35.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. plate	38.00 to 39.00
No. 1 cupola cast.	40.00 to 42.00
Heavy breakable cast.	31.00 to 33.00
Stove plate	35.00 to 36.00
Automotive cast.	44.00 to 45.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$36.50 to 37.00
No. 2 hvy. melting	31.50 to 32.00
No. 1 bundles	36.50 to 37.00
No. 2 bundles, black	30.50 to 31.00
No. 2 bundles, mixed	27.50 to 28.00
Machine shop turn.	20.50 to 21.00
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	23.50 to 24.00
Cast iron borings	23.50 to 24.00
Low phos. 18 in. under	47.00 to 48.00
Rails, random lengths	43.00 to 44.00
Rails, 18 in. and under	51.00 to 52.00
No. 1 cupola cast.	47.00 to 48.00
Hvy. breakable cast.	39.00 to 40.00
Drop broken cast.	49.00 to 50.00

San Francisco

No. 1 hvy. melting	$22.00
No. 2 hvy. melting	20.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	22.00
Scrap rails, random lgth.	22.00
No. 1 cupola cast.	$32.50 to 34.00

Los Angeles

No. 1 hvy. melting	$22.00
No. 2 hvy. melting	20.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	7.50
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	22.00
No. 1 cupola cast.	$37.50 to 40.50

Seattle

No. 1 hvy. melting	$18.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Elec. fur. 1 ft and under	$29.00 to 30.00
RR. hvy. melting	19.00
No. 1 cupola cast.	30.00 to 35.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	$30.00
No. 1 bundles	30.00
No. 2 bundles	29.50
Mechanical bundles	28.00
Mixed steel scrap	26.00
Mixed bor. and turn.	23.00
Rails, remelting	30.00
Rails, rerolling	33.00
Bushelings	24.50
Bush., new fact, prep'd.	29.00
Bush., new fact, unprep'd.	23.00
Short steel turnings	23.00
Cast scrap	40.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	June 13, 1950	June 6, 1950	May 16, 1950	June 14, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plates	3.50	3.50	3.50	3.40
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.00
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.35	6.35	6.35	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	June 13, 1950	June 6, 1950	May 16, 1950	June 14, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$50.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	49.08	45.47
No. 2, Birmingham	42.38	42.38	42.38	39.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	49.74
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	68.24
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	*$44.75*	$46.75	$36.75	$22.50
Heavy melt'g steel, Phila.	*34.50*	36.50	28.00	19.50
Heavy melt'g steel, Ch'go	39.50	39.50	32.50	20.75
No. 1 hy. com. sh't, Det.	*39.50*	43.50	34.75	15.75
Low phos. Young'n	*45.25*	46.25	37.75	22.25
No. 1, cast, Pittsburgh	43.75	43.75	42.00	26.50
No. 1, cast, Philadelphia	39.50	39.50	37.50	27.50
No. 1, cast, Chicago	48.50	48.50	45.50	28.88
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.25
Foundry coke, prompt	16.25	16.25	16.25	16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	22.50	22.50	19.50	16.50
Copper, Lake, Conn.	22.625	22.625	19.625	18.625
Tin Straits, New York	*77.50*†	78.00*	76.50	$1.03
Zinc, East St. Louis	15.00	14.50	12.00	9.50
Lead, St. Louis	11.80	11.80	11.80	11.85
Aluminum, virgin	17.50	17.50	17.00	17.00
Nickel electrolytic	51.22	51.22	42.97	42.93
Magnesium, ingot	21.50	21.50	20.50	20.50
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50

† Tentative. * Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
June 13, 1950	3.837¢ per lb.	$46.38 per gross ton	*$39.58* per gross ton
One week ago	3.837¢ per lb.	46.38 per gross ton	40.92 per gross ton
One month ago	3.837¢ per lb.	46.38 per gross ton	32.42 per gross ton
One year ago	3.705¢ per lb.	45.91 per gross ton	20.92 per gross ton

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3	$46.38 Feb. 7	$45.88 Jan. 3	$40.92 June 6	$26.25 Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396c Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1932	1.89196¢ July 5	1.83910¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron as Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

You can bank on STAINLESS STEEL

at the Pelham Parkway Branch
of The Bronx Savings Bank
(Hubert E. Reeves, Architect)

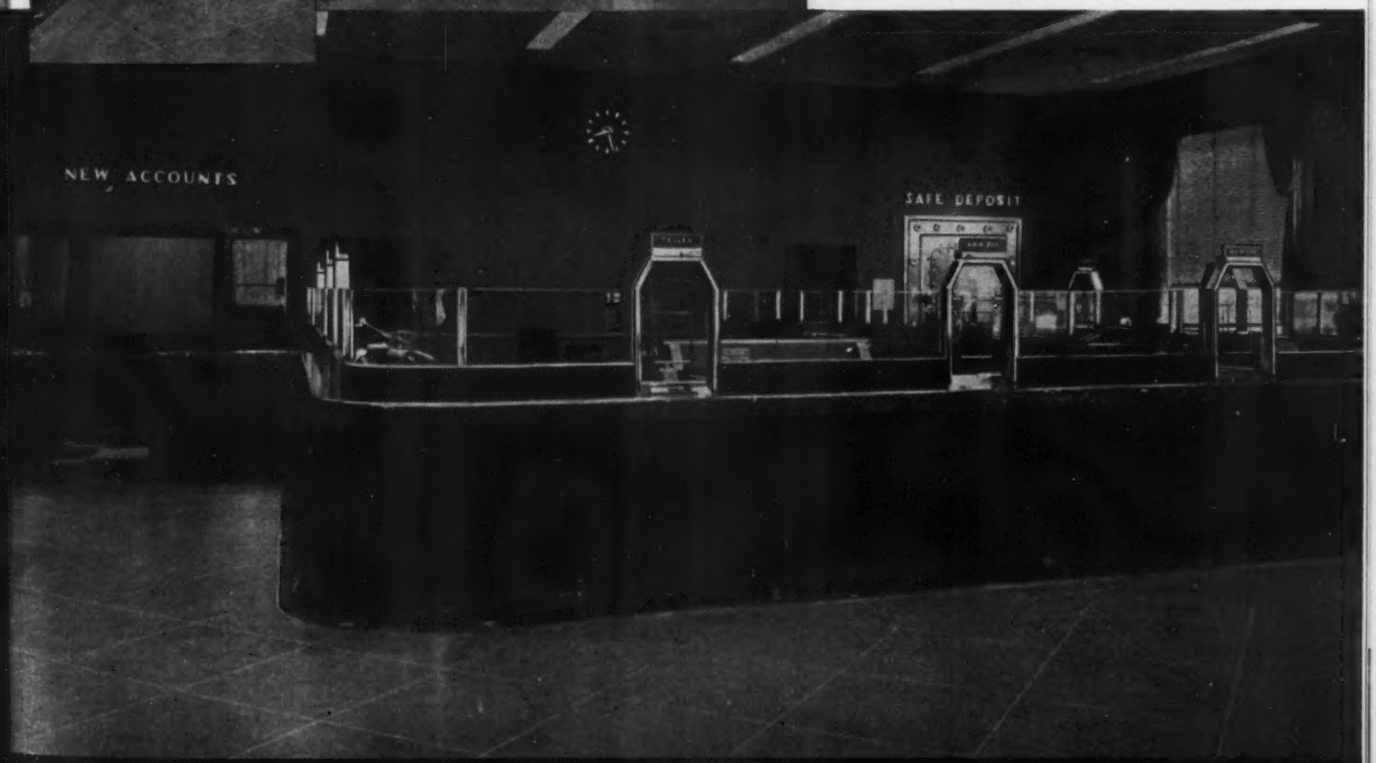
The proven low maintenance cost of stainless steel was a primary reason for its selection for application in the Pelham Parkway Branch of The Bronx Savings Bank.

In this gem of a neighborhood bank, the stainless steel, buffed to a satin finish, gives a pleasing and luxurious appearance.

Stainless steel is also outstanding for its adaptability to architectural forms for both exterior and interior applications, including such a wide variety as curtain walls, window frames, grill doors, ornamental trimmings, and even tiny screws.

To insure the production of consistently high grade stainless steel, the use of ferro chromium of dependable quality and precise analysis is of prime importance. Vancoram Brand Ferro Chromium, made by closely controlled processing methods from carefully selected raw materials, fills these requirements. Low-carbon grades for the manufacture of stainless steel are supplied with a carbon content from 0.06% max. to 2.00% max., all containing from 67% to 72% chromium.

If you have a technical problem involving the making, treatment, fabrication, properties, or performance of stainless steel, our metallurgical engineers will be glad to help you solve it.



VANADIUM CORPORATION OF AMERICA
420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • DETROIT • CHICAGO • CLEVELAND • PITTSBURGH

MAKERS OF ALLOYS
VANCORAM
CHEMICALS AND METALS

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00 1													$50.00 81
Alloy, net ton	$51.00 1.17													$51.00 81
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00 1	$53.00 1	$53.00 1				$57.00 13		$53.00 3	$58.00 26	$53.00 3			
Carbon forging billets, net ton	$63.00 1	$63.00 1.4	$63.00 1.6	$63.00 4			$63.00 25		$63.00 3.4	$65.00 26	$63.00 3			$66.00 81
Alloy, net ton	$66.00 1.17	$66.00 1.4	$66.00 1		$66.00 6.42		$66.00 13	$66.00 3	$66.00 3.4	$68.00 26	$66.00 3			$66.00 81
PIPE SKELP	3.15 1						3.15 1.4							
WIRE RODS	3.85 2.18	3.85 2.4.83	3.85 6	3.85 2			3.85 6				3.85 3	3.95 3		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35 1.5.9.15	3.35 23	3.35 1.6.8	3.35 4.5			3.35[1.4.6] 13 3.50		3.35 3	3.45 26		3.35 3		3.55[12] 47 4.15
Cold-rolled	4.10[1.5.7.9.15] 5.10[83]		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 3			4.10 3	4.30 22	4.30 13
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 6		4.65[44] 4.75[44]					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40[6] 4.90[76]						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 64							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.13		5.05 3	5.05 26		5.05 3		5.25 12
Hi str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
Hi str. low alloy, galv.	6.75 1											6.75 3		
STRIP Hot-rolled	3.25 5.7.9.35 3.50[41]	3.25 8.66	3.25 1.6.8	3.25 5			3.25[1.4.6] 13 3.50		3.25 3	3.35 26		3.25 3		3.45[12] 47 4.05
Cold-rolled	4.15 5.7.9 63 4.50	4.30 8.66	4.30 8	4.15 2.5		4.15 7	4.15 4.6.48.69 4.50 12.40		4.15 3			4.15 3		4.35[12] 47 4.95
Hi str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.13		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2.5			6.20 4.6.13		6.40 3			6.40 3		6.40 12
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50 1.5.9.15		$7.50 1.6.8				$7.50 4					$7.60 3	$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 3	5.50 22	
BARS Carbon steel	3.45 1.5.9.17	3.45 1.4.23	3.45 1.6.8	3.45 4	3.45 6		3.45 1.4.6		3.45 3.4		3.45 3			3.65 12
Reinforcing‡	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4			3.45 1.4.6		3.45 3.4		3.45 3	3.45 3		
Cold-finished	4.10[5] 4.15[2.6] 17.52.69.71	4.15[2] 23.69.70	4.15 4.73.74	4.15 2.61	4.15 4.32.52		4.15 6.40.57		4.15 70					4.35[12] 4.30[64]
Alloy, hot-rolled	3.95 1.17	3.95 1.4.23	3.95 1.6.8		3.95 4		3.95 1.6.25	3.95 3	3.95 3.4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2.17.52.69.71	4.90 2.23.69.70	4.90 4.73.74	4.90 2.61	4.90 4.42.52		4.90 6.25.57	4.90 3	4.90 3.70					5.05[64]
Hi str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE Carbon steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.13		3.80 3	3.60 26	3.50 3	3.50 3		3.75 12
Floor Plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 13			4.40 26	4.40 3	4.40 3		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.3	5.35 4.5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural	3.40 1.5.9	3.40 1.23	3.40 1.6.8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.20 3	5.20 3		5.20 3			
MANUFACTURERS' WIRE Bright	4.50 2.5.18	4.50[2] 4.12.33.34		4.50 2.77			4.50 6	Kokomo—4.60[30]			4.50 3	4.60 3	Duluth—4.50[3] Pueblo—4.75[14]	
PILING, Steel Sheet	4.20[1.9]	4.20 1							4.20 3					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging, net ton
	$59.00 83				Alloy, net ton
		$53.00 11	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00 83	$63.00 11	F=$82.00[19]	Geneva=$63.00[16]	Carbon forging billets, net ton
	$74.00 83		F=$85.00[19]		Alloy net ton
					PIPE SKELP
	4.25 83	3.85 11	SF=4.50[24] LA=4.65[24,62]	Portsmouth=3.85[20] Worcester=4.15[2]	WIRE RODS
		3.35 4,11	SF,LA=4.05[24] F=4.25[19]	Ashland=3.35[7] Niles=3.50[64]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10 11	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40 4,11	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05 11	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 83	3.85 83	3.25 11	SF, LA=4.00[24,62] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.40[19] LA=5.50[27]	New Haven=4.65[2,68]	Cold-rolled
		4.95 11	F=6.84[19]		Hi Str. low alloy, h. r.
			F=6.95[19]		Hi Str. low alloy, c.r.
		7.60 11	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05 83	3.85 83	3.45 4,11	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[65]	BARS Carbon steel
4.05 83	3.85 83	3.45 4,11	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55 83	4.35 83		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20 11	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90 83	3.50 4,11	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.60[29] Coateaville=3.60[21] Harrisburg=3.85[35]	PLATE Carbon steel
				Harrisburg=4.55[35]	Floor plates,
			F=5.40[19]	Coateaville=4.50[21]	Alloy
		5.35 11	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00 83	3.80 83	3.40 11	SF=3.95[62] LA=4.00[24,62]	Phoenixville=3.30[56] Geneva=3.40[16]	SHAPES, Structural
		5.15 11	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi Str. low alloy
5.10 83	4.90 83	4.50 4,11	SF, LA=5.45[24,62]	Portsmouth=4.50[20] Worcester=4.80[2]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes deduct $1.15 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principle Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24. Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*; add 0.20¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

MERCHANT WIRE PRODUCTS

To dealers, f.o.b. mill	Base Column	Pittsburg, Calif.
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	Pittsburg, Calif.
Merch. wire annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance, 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence Posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle	4.35
Track bolts, untreated**	8.85
Track bolts, heat treated, to railroads**	9.10

** Minnequa, deduct 25¢. † Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown 3; Minnequa, 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	Black	Galv
½-in.	40½ to 38½	24 to 22
¾-in.	43½ to 41½	28 to 26
1-in.	46 to 44	31 to 29
1¼-in.	46½ to 44½	31½ to 29½
1½-in	47 to 45	32 to 30
2-in.	47½ to 45½	32½ to 30½
2½ to 3-in.	48 to 46	33 to 31
Steel, lapweld		
2-in.	38	22½
2½ to 3-in.	42	26½
3½ to 6-in.	43 to 40	27½ to 24½
Steel, seamless		
2-in.	36	20½
2½ to 3-in.	39	23½
3½ to 6-in.	41	25½
Wrought iron, buttweld		
½-in.	+26½	+53
¾-in.	+16½	+42
1 & 1¼-in.	+10½	+33
1½-in	+ 4½	+29½
2-in.	+ 4	+29
Wrought iron, lapweld		
2-in.	+13½	+37
2½ to 3½-in.	+11	+32½
4-in.	+ 6	+26½
4½ to 8-in.	+ 8	+28
9 to 12-in.	+18	+37½

Extra Strong, Plain Ends

Steel, buttweld		
½-in.	39½ to 37½	24½ to 22½
¾-in.	43½ to 41½	28½ to 26½
1-in.	45½ to 43½	31½ to 29½
1¼-in.	46 to 44	32 to 30
1½-in.	46½ to 44½	32½ to 30½
2-in.	47 to 45	33 to 32
2½ to 3-in.	47½ to 45½	33½ to 31½
Steel, lapweld		
2-in.	37	22½
2½ to 3-in.	42	27½
3½ to 6-in.	44½ to 41½	30 to 27
Steel, seamless		
2-in.	35	20½
2½ to 3-in.	38	24½
3½ to 6-in.	42½	28
Wrought iron, buttweld		
½-in.	+22	+47
¾-in.	+15½	+40
1 to 2-in.	+ 5½	+29
Wrought iron, lapweld		
2-in.	+10½	+33½
2½ to 4-in.	+ 1	+22
4½ to 6-in.	+ 5	+26½
7 & 8 in.	list	+21½
9 to 12-in.	+11½	+29½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct.
* Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in In.	gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

Prices continued on next page

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Baltimore	5.15	6.39[1]	6.55[2] 6.65	5.59–5.59[11]	....	6.04[11]	5.89	5.79[11]	6.19	9.69	9.99	11.12	11.49
Birmingham*	5.15[10]	5.95	....	5.10[10]	....	5.40	5.25	5.10[10]	6.88	....	....	....	....
Boston	5.75	6.55[10]	6.94[3]	5.70	6.90–6.95	6.08	5.75	5.60	6.19–6.69	9.70–9.97	8.50–10.00	11.15	11.45
Buffalo	5.15	5.95	6.94	5.41	7.27	5.65	5.35	5.15	5.75	9.60	9.90	11.05	11.35
Chicago	5.15	5.95	6.85	5.10	6.80	5.40	5.25	5.10	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.42–5.97	5.99–6.24	6.39	5.35	....	5.79 5.79	5.64 5.64	5.35–5.54	5.95–6.25	9.60–9.81	9.80–10.11	11.05–11.26	11.35–11.56
Cleveland	5.15	5.95	7.00–7.10	5.24	6.35	5.52	5.37	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27–6.58	5.79	5.64	5.39	5.91	9.56	9.86	11.01	11.31
Houston	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35–10.45	10.50–10.60	11.50	11.95–12.10
Indianapolis	....	....	....	....	7.36	....	....	....	....	....	....	....	....
Kansas City	5.65	6.40	....	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles	5.90	7.65	7.60[3]	6.15	8.35[16]	6.00	6.10	6.10	7.55	10.75	10.75	12.45	12.75
Memphis	5.93	6.68	....	5.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee	5.29	6.09	6.94–6.99	5.24	6.32	5.54	5 39	5.24	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.85[1]	....	5.55[1]	6.90[1]	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55–5.65	6.54–6.64[1]	7.20[3]	5.84	6.76[5]	6.10	5.85	5.95	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	....	6.30	....	6.15	6.20	6.15	7.20	....	....	....	....
Philadelphia*	5.30	6.20	6.85[2]	5.65	6.29	5.45	5.25	5.50	6.21	9.35	9.65	10.80	11.10
Pittsburgh	5.15	5.95	6.60	5.20	6.00	5.35	5.25	5.10	5.75	9.25	9.55	10.70	11.00
Portland	6.60–7.10[1]	8.40[2]	....	6.85[9]	....	6.40[9]	6.50	6.45–6.45[9]	8.80[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	5.85	6.70	....	7.45	8.75	6.10[3]	5.90	7.35[8]	8.75	....	....	....	....
San Francisco*	6.25[11]	7.60[2]	7.85[2]	6.75[11]	7.85[16]	6.15[11]	6.00[11]	6.15[11]	7.55	10.75	10.75	12.45	12.75
Seattle	6.60[4]	8.15[2]	8.40[2]	6.85[4]	....	6.35[4]	6.20[4]	6.35[4]	8.50[14]	....	11.60[18]	....	13.60[18]
St. Louis	5.48	6.28	7.18	5.43	6.68–7.54	5.73	5.58	5.43	6.08	9.58	9.88	11.03	11.33
St. Paul*	5.71	6.51	7.41	5.66	6.16–6.82	5.96	5.81	5.66	6.31	9.81	10.11	11.26	11.56

BASE QUANTITIES: *(Standard unless otherwise keyed on prices.)* Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....
Birmingham	41.88	42.38	....	....	.....
Buffalo	46.00	46.50	47.00	....	.....
Chicago	46.00	46.50	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	....	50.50	51.00	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Ironton, Utah	46.00	46.50	....	....	.....
Pittsburgh	46.00	46.50	46.50	47.00	.....
Geneva, Utah	46.00	46.50	....	....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	....	....	....	.....
Swedeland	48.00	48.50	49.00	49.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	48.00	48.50	49.00	....	54.00
Youngstown	46.00	46.50	46.50	47.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Boston	Steelton	6.90	.....	....	....	....	60.90
Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Cincinnati	Birmingham	6.70	48.58	49.08	....	....	.....
Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Los Angeles	Geneva-Ironton	7.70	53.70	54.20	....	....	.....
Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Philadelphia	Steelton	3.09	.....	.....	.....	.....	57.09
Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Seattle	Geneva-Ironton	7.70	53.70	54.20	....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

LEBANON ALLOY CASTINGS

Resist Sulphuric Acid Attack

Valve Bodies and Fittings cast at Lebanon in various special sulphuric acid resistant alloys.

FOR CHEMICAL AND PROCESS INDUSTRY APPLICATIONS . . .

DURING the period of development of special alloys to resist sulphuric acid and sulphuric and nitric acid combinations, Lebanon played an important part in proving their value as casting material. Lebanon Circle L 34 (Stainless Type FA 20*), analysis of which is given below, is an alloy created to meet this demand. Circle L 34, in addition to its resistance to sulphuric and nitric acid, offers good resistance to alkalis and alkali salts.

Our familiarity with the manufacture of castings of special alloy materials means that we can readily meet your requirements. Every Lebanon casting is made to exacting standards, inspected and thoroughly tested before shipping. A complete laboratory, including a million-volt X-Ray machine, is one of the facilities upon which our customers constantly rely.

Do you have copies of the Lebanon Data Sheets? If not, just let us know and we will send them along to you.

LEBANON CIRCLE Ⓛ 34

NOMINAL ANALYSIS

Carbon Max.	0.07 Max.
Silicon	1.25
Manganese	0.75
Chromium	20.50
Nickel	28.50
Molybdenum	2.50
Copper	4.25

NOMINAL PHYSICAL PROPERTIES

Tensile Strength	72,000
Yield Point	35,000
Elongation in 2"—%	45
Brinell Hardness	150

Heat treatment: Water quenched.

*Circle L 34 (FA 20) DuPont Specification 1364

LEBANON STEEL FOUNDRY • LEBANON, PA.
"In the Lebanon Valley"

LEBANON ALLOY AND STEEL **Castings**

CIRCLE L

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. & shorter	26	37
All diam, longer than 6 in.	22	34
Lag, all diam, longer than 6 in.	23	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagons or Square)

	Pct Off List
½ in. and smaller	25 37
9/16 to ⅝ in.	23 35
¾ to 1½ in. inclusive	23 35
1⅝ in. and larger	16 29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 to ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	..

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa. $7.25

Small Rivets

(7/16 in. and smaller)
Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 43

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	23
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
CARBON		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
20	84, 90	7.50¢
17	60, 72	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)..	*26.50	
Washgtn, Pa. (39)....	*26.50	
Claymont, Del. (29)...	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55).	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville (26)..	27.50	
Inconel-carbon		
10 pct, Coatesville (21)..	36.00	
Monel-carbon		
10 pct, Coatesville (21)..	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7).....		7.75

* Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	39.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

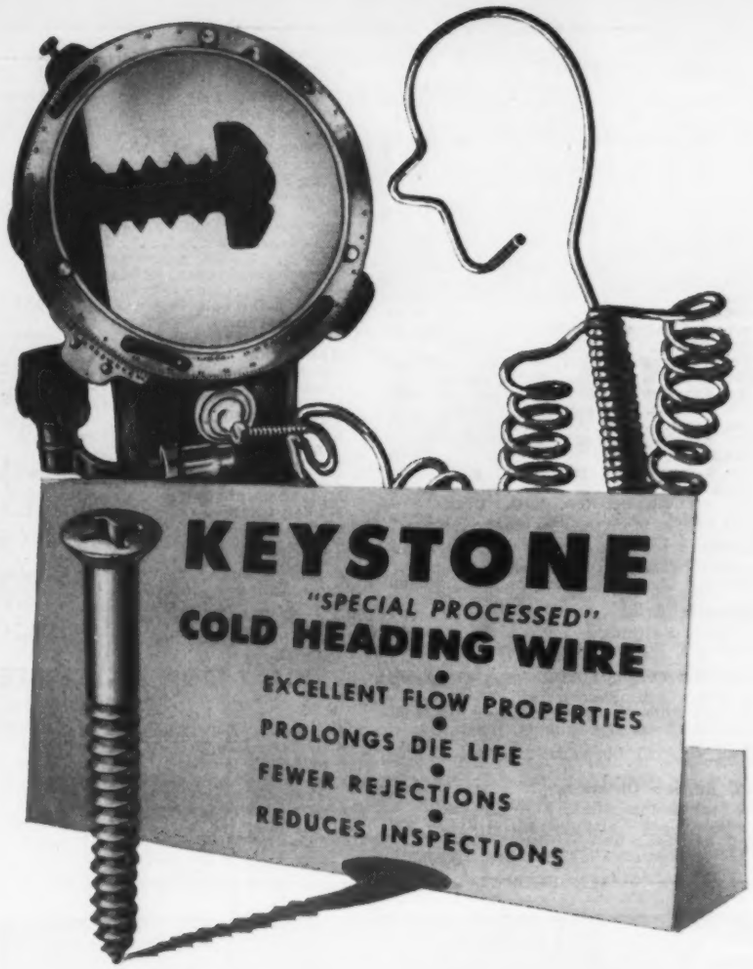
	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$24.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	23.40
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	21.25
Swedeland, Pa., f.o.b.	21.20
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	21.00
St. Louis, del'd	22.18
Birmingham, del'd	20.20

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF, content:

70% or more	$37.00
60% or less	34.00

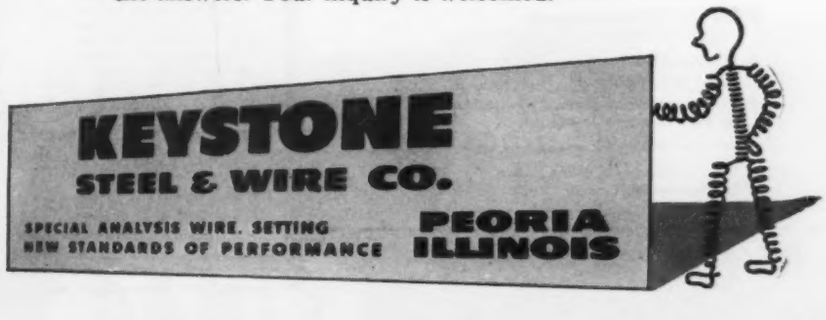
Prices Continued on Next Page



Production reports prove that Keystone's new "special processed" cold heading wire effects considerable savings in the manufacture of Phillips head, clutch head and cross recessed head screws.

The excellent flow properties of this new wire deliver the desired upsetting and die forming qualities with a high degree of uniformity. Die and plug life are often more than doubled . . . finished product rejections are minimized . . . the cost of expensive final inspection is reduced. The superior plating qualities of "special processed" wire further assure a better finished product.

Regardless of the performance demanded in your wire products, consult Keystone for the materials to meet your most exacting specifications. If special treatment is required, Keystone's metallurgical research and testing facilities are available to supply the answers. Your inquiry is welcomed.



REFRACTORIES

Fire Clay Brick (*F.o.b. works*) *Carloads, Per* 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $86.00
No. 1 Ohio 80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 80.00
No. 2 Ohio 72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $86.00
Childs, Pa. 90.00
Hays, Pa. 91.00
Chicago District 95.00
Western Utah and Calif. 101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago 106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 15.00
Silica cement, net ton, bulk, Hays, Pa. 17.00
Silica cement, net ton, bulk, Ensley, Ala. 16.00
Silica cement, net ton, bulk, Chicago District 16.00
Silica cement, net ton, bulk, Utah and Calif. 22.50

Chrome Brick *Per Net Ton*

Standard chemically bonded, Balt., Chester $69.00

Magnesite Brick

Standard, Baltimore $91.00
Chemically bonded, Baltimore 80.00

Grain Magnesite *St. ⅜-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed ... $56.00 to $57.00
Domestic, f.o.b. Chewelah, Wash., in bulk 33.00
in sacks 38.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ $12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags ... 7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East ..... 10.00¢
Domestic sponge iron, 98+% Fe, carload lots ..... 9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe ..... 48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe .. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe 70.0¢ to $1.35
Aluminum ..... 31.50¢
Brass, 10 ton lots ..... 23.50¢ to 27.25¢
Copper, electrolytic ..... 27.75¢
Copper, reduced ..... 27.00¢
Cadmium, 100-199 lb $2.95
Chromium, electrolytic, 99% min., and quantity $3.50
Lead ..... 17.00¢
Manganese ..... 52.00¢
Molybdenum, 99% $2.65
Nickel, unannealed ..... 56.00¢ to 66.00¢
Nickel, annealed ..... 72.00¢
Nickel, spherical, unannealed 69.00¢
Silicon ..... 34.00¢
Solder powder ..... 8.5¢ plus metal values
Stainless steel, 302 ..... 75.00¢
Tin ..... 85.75¢
Tungsten, 99% $2.90
Zinc, 10 ton lots ..... 15.75¢ to 18.50¢

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago .. $91.80 to $95.30
6 to 24-in., del'd N. Y. ..... 91.00 to 92.00
6 to 24-in., Birmingham ... 78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $108.50 to $113.00
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.
F.o.b. Birmingham $174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont. $172
F.o.b. Johnstown, Pa. $174
F.o.b. Sheridan, Pa. $172
F.o.b. Etna, Clairton, Pa. $175
$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.
Carload, bulk 10.45
Ton lots 12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.
Carload, packed 35.5
Ton lots 37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
Carloads 28
Ton lots 30
Less ton lots 32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 18.15¢

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered. 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.
Carload bulk 8.95
Ton lots 10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet 10.30
Ton lots 11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.
96% Si, 2% Fe 20.70
97% Si, 1% Fe 21.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.
Carload, bulk 6.30
Ton lots 7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

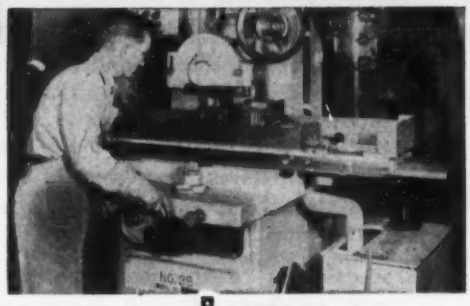
Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots ..	2.40	3.30	4.55

Prices Continued on Next Page

Enthusiastic Customers do our BEST advertising



A Grand Rapids No. 35 Hydraulic Feed Surface Grinder at the Lakewood, Ohio, plant of V & S Die and Mold, Inc., who report, "It produces an exceptionally smooth finish, which is essential to us in our work."

You will appreciate the micro-inch finish produced at production speeds on Grand Rapids Grinders. All Grand Rapids Hydraulic Feed Surface Grinders have these outstanding features:

1. One-piece column and base casting for vibrationless rigidity
2. Precision ball-bearing spindle which is greased for life
3. Bijur one-shot lubrication system eliminating hand oiling
4. Patented vertical movement of wheel head for quick, accurate adjustments
5. Portable coolant tank for ease of coolant replacement
6. Vane type hydraulic pump for fast longitudinal table travel

To serve you—

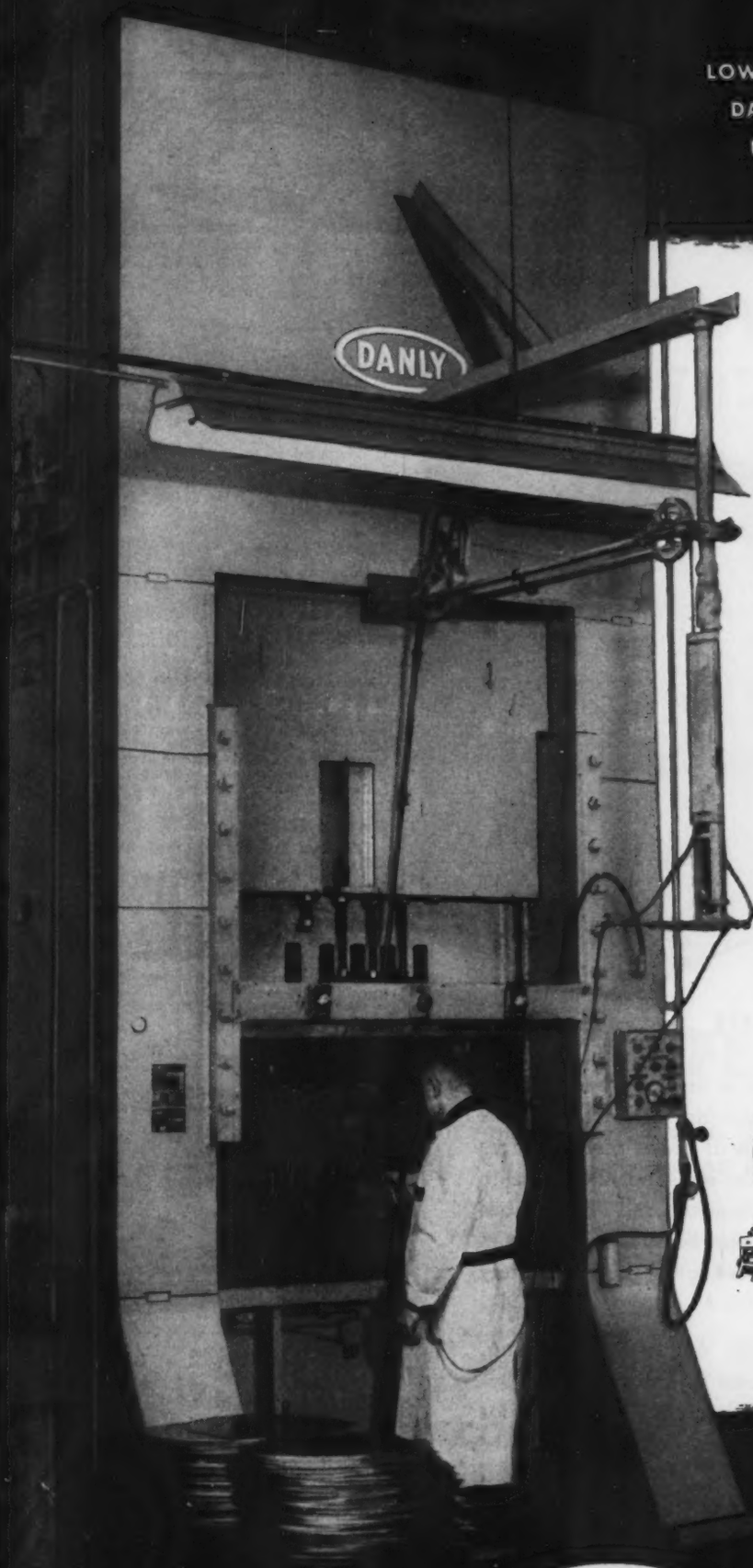
Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter and Tool Grinders, Hand Feed Surface Grinders, Drill Grinders, Tap Grinders, and Combination Tap and Drill Grinders.

GRAND RAPIDS GRINDERS

GALLMEYER & LIVINGSTON COMPANY

200 Straight, S. W., Grand Rapids 4, Mich.

FOR EASE OF MAINTENANCE,
LOW OPERATING COSTS AND DEPENDABLE
DAY IN AND DAY OUT PERFORMANCE,
LEADING MANUFACTURERS* SPECIFY



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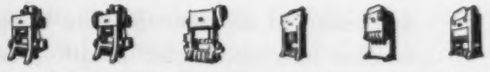
... the key to stamping economy!

On mass-production lines and under exacting precision stamping requirements, Danly presses are establishing new performance records. Outstanding improvements in press engineering, design and construction assure longer uninterrupted production runs, increased die life and greater operating safety.

The new Danly clutch alone, designed to combat heat, major cause of press clutch wear, is proof of Danly press engineering leadership. Other outstanding features include complete pressure lubrication and a specially designed press control system. Write today for specific information on the advantages of Danly Presses in *your* plant.

Send for this new Danly Straight Side Press Catalog

*The 175 ton straight side DANLY press shown is located in the new A. B. Dick plant, manufacturers of mimeograph office equipment.



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HYDROSTATIC testing of tubes is fast and easy on this completely self-contained machine. It handles tubes 4½" to 12" of maximum 35' length at preset test pressures of 700 to 1500 pounds, sealed on the ends, outside or inside diameters as desired. Maximum diameter and length tubes are tested at an average rate of one every 2 minutes, but smaller size or shorter length tubes give proportionately larger production.

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EST. 1803

R. D. Wood Company

[illegible] PHILADELPHIA, PA.

MARKETS & PRICES

Continued

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			20.50
62-66% Cr, 4-6% C, 6-9% Si.			21.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contrast price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C.	$1.09
0.50% max. C	1.05
.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.50
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

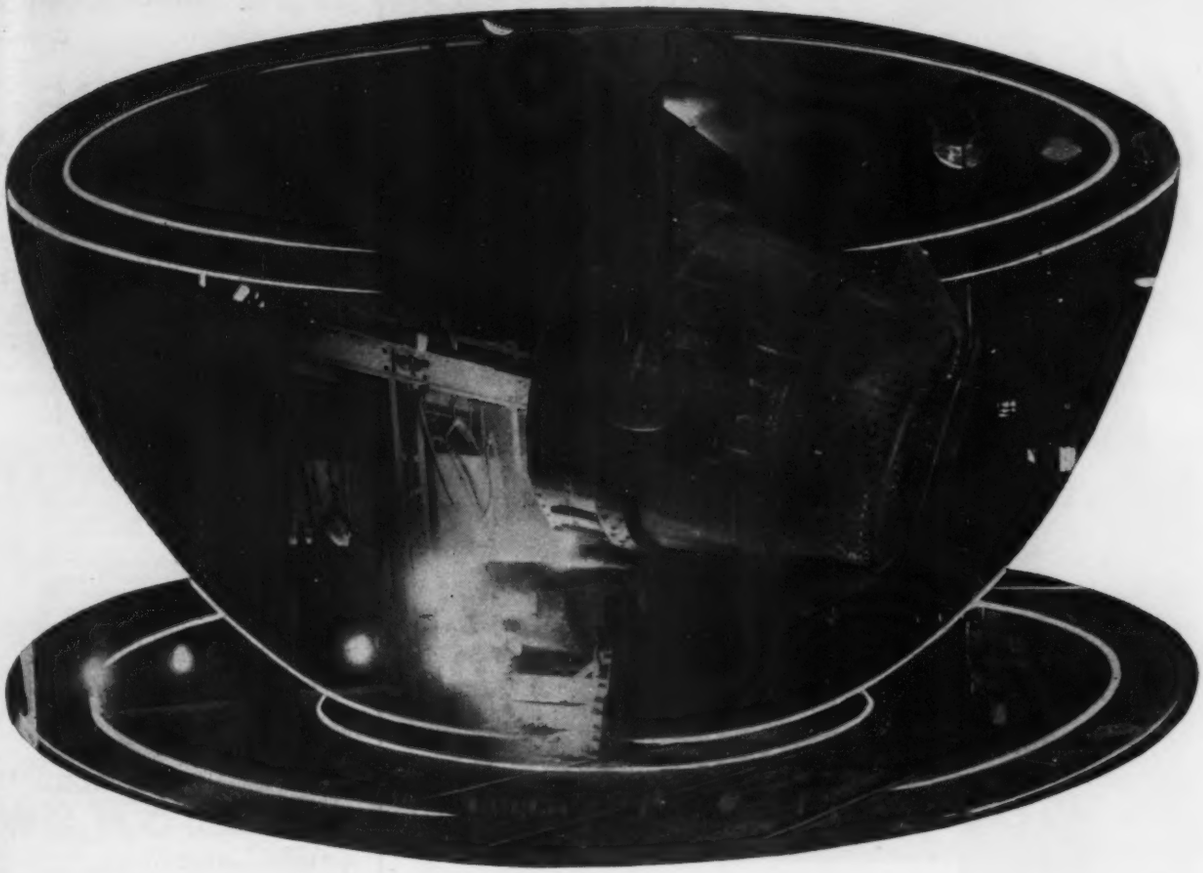
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Prices Continued on Page 158



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Down on the open hearth floor they call molten iron "hot soup." Charged with scrap and made into steel—the result is "food" for all industry.

Wisconsin Steel takes pride in producing the finest carbon and alloy steel. Metallurgical control keeps quality high. We believe our product is good "food" for industry.

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Socket Head

Screws

Here's what the Kaufman *Double Extrusion* Process does for Socket Head Screws. It gives them greater strength by creating beneficial changes in the steel's grain flow. Sockets are formed in one operation—perfectly concentric, true hex with sharp corners, and *clean*—all the way to the bottom. It pays you to specify and buy Cleveland Socket Head Screws.

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Specialists for more than 30 years in

CAP SCREWS, SET SCREWS, MILLED STUDS

Ask your jobber for Cleveland Fasteners

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo	96¢
Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.	
Ton lots	$3.50
Less ton lots	3.55
Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	$2.67
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	$1.13
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.40
Less ton lots	$1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	$167.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢

Boron Agents

Contract prices per lb of alloy, del.	
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$4.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.; 100 lb, up	
10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	$1.46
Less ton lots	1.57
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢

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Capacity 1¼" X 12'

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Light and heavy machinery for all classes of sheet metal, plate and structural work.

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if you want your products before the men who do the buying in the metalworking industry. The Iron Age.

AIR COMPRESSOR

1000 Cu. Ft. Worthington "Feather Valve," 18" x 11" x 14" two stage with 185 HP synchronous motor on shaft.

AUTOMATIC

4⅜" Conomatic 4 spindle, serial No. 2191K with, reel, chip conveyor, extra equipment.

BORING MILLS

4½ bar Lucas No. 33. Table 46" x 64" Max. height 36", Max. to outboard support 11'.

100" Niles Bement Pond. Extra heavy type. 2 swivel heads, power rapid traverse, 35 HP direct current motor.

BROACH

15 ton 36" stroke American vertical duplex surface with tilting type workholder.

DRILL

42 spindle, No. B16 Natco multiple with 18" x 48" drilling area and two box tables.

GEAR HOBBER

Type T Barber Colman. Designed for either straight or taper splines, helical or spur gears. Also type A and Nos. 3 & 12 Barber Colmans.

GRINDERS

6" x 18", No. 10 Brown & Sharpe "Electric Hydraulic" Three with and two without spindle oscillation. New 1940 and 1941.

10" x 36" Norton type C hydraulic with hydraulic quick in-feed. Serial No. C16458, new in 1942.

10" x 72" Norton type C hydraulic made at factory to swing 14". Serial No. 21750, new in 1944.

23" x 36" Norton type C with mechanical table traverse, hydraulic quick in-feed. Serial No. C18281, new 1943.

LATHE TURRET

No. 2FU Foster Fastermatic Serial No. 2FU529, new in 1944. Quite a little tooling.

MILLERS

Cincinnati Hydromatic Sizes: 3-24, 34-36, 4-36, 4-48, 5-48, 56-72 and 56-90.

PRESSES

1000 ton, No. 666 Toledo knuckle joint Coining. 2½" stroke, 18" shut height, bed 37" F to B x 31" R to L.

350 ton Clearing Crankless, model F1350-42, serial No. 45-11155P, new 1945. 20" stroke, 28" shut height, 36" x 42" bed.

600 ton Hamilton No. 2316½ eccentric shaft forging. Stroke 4"; shut height 16" bed 28" F to B x 23¾" R to L.

No. 506 Bliss on inclined legs with double roll feed and scrap cutter. About 126 tons. 3" stroke, 11½" shut height.

1000 ton Baldwin Southwark "Hy-Speed" hydraulic. 20" stroke, 56" daylight, bed 42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has suspended slides with long overarm guide. Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive gears, suspended slides, self contained backshaft, 30 HP motor.

MILES MACHINERY CO.
SAGINAW, MICH.

THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

MDNA President—Frank Laurens, of Laurens Brothers, Inc., Cincinnati, is the newly elected president of the Machinery Dealers National Assn. He was voted into office at the recent national MDNA election at the Detroit convention. Mr. Laurens was not present at the time. He is currently on an extended business-vacation in Europe. The accompanying shot is a retouched passport photo.

Frank Laurens

Revised ECA Policy — Pittsburgh segments of the used machinery industry are expecting a heavier volume of foreign business now that ECA has eased up on its policy of discouraging purchase of used and rebuilt equipment with ECA funds.

A leading broker in the Pittsburgh area is optimistic about the outcome of his negotiations with a Greek steel combine, which has asked for quotations on several pieces of heavy equipment.

In addition to the change in ECA policy, the Federal Government is showing increased interest in mill machinery. This interest began to become evident within the last several weeks. However, no one here would hazard a guess as to the reason.

Midwestern NISA — Wage and pension plans, shop practices, and association topics were discussed at the recent meeting of the Midwestern chapter of the National Industrial Service Assn. held in Omaha, Neb. Forty pct of those in attendance planned to attend the Boston convention.

Officers elected for the 1950-51 year were: E. A. Pedersen of Schneider Electric Works, Omaha, Neb., as chairman; T. M. Paul of Paul Electric Co., Sioux City, Iowa, as vice-president; and C. J. Miller of H. W. Miller Electric Co., Omaha, Neb., as secretary-treasurer.

Chicago MDNA—At the recent meeting of the Chicago chapter of the Machinery Dealers National Assn., new committees for 1950-1951 were appointed. Eliot Blumberg of Adams Machinery Co. was appointed chairman of the membership committee, Robert Rice of Robert W. Rice & Co. was made public relations chairman and Jack Segal of the Acme Equipment Co. was named chairman of the entertainment committee.

During the meeting the new price and serial books recently compiled by the MDNA, were distributed to those members who did not receive them at the annual convention held in Detroit several weeks ago.

Rebuilding Idea — Warner & Swasey Co., which recently set up a trade-in and rebuilding program for Warner & Swasey turret lathes, reports that it has sold ten rebuilt machines during the past month and that it now has a $100,000 backlog in orders. The company hopes to get this program up to $100,000 a month, officials report. Other turret lathe builders are working on parallel if not similar program.

ECA Money—Marshall Plan expenditures and guarantees of about $20.5 million were announced last week. They are about $4.5 million for modernization of the Milan, Italy, FLACK steel works; an additional $3.5 million for machine tools for the Italian FIAT automotive and steel works; and $1.3 million to buy oil prospecting and drilling equipment for French North Africa.